Evaluation of LAAO Devices

Dr Julie Humphries

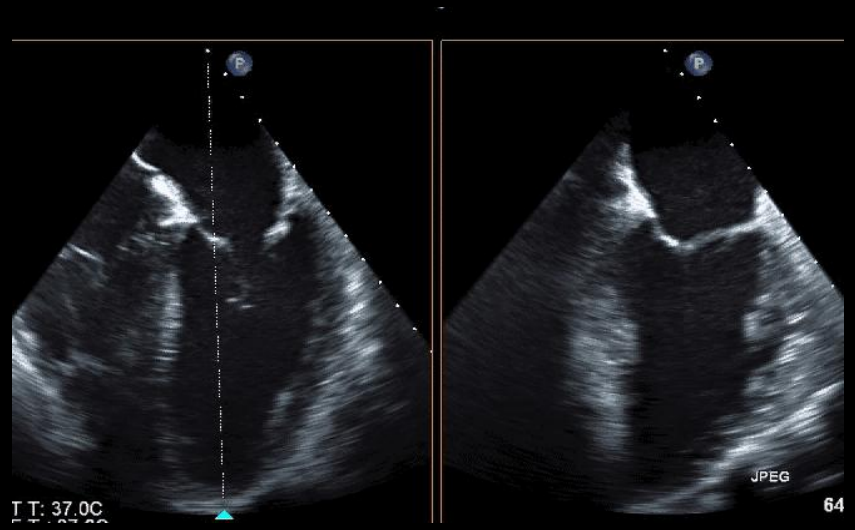
ECHO AUSTRALIA

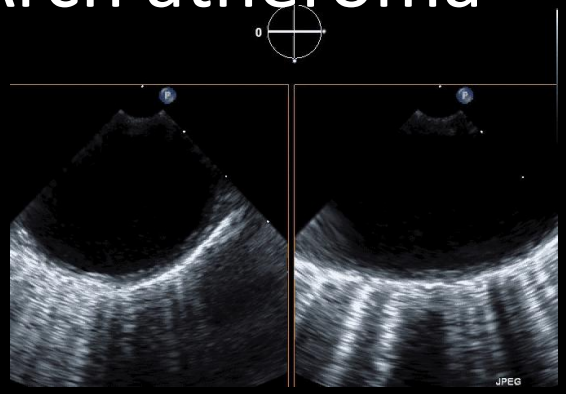
17-19 March 2025

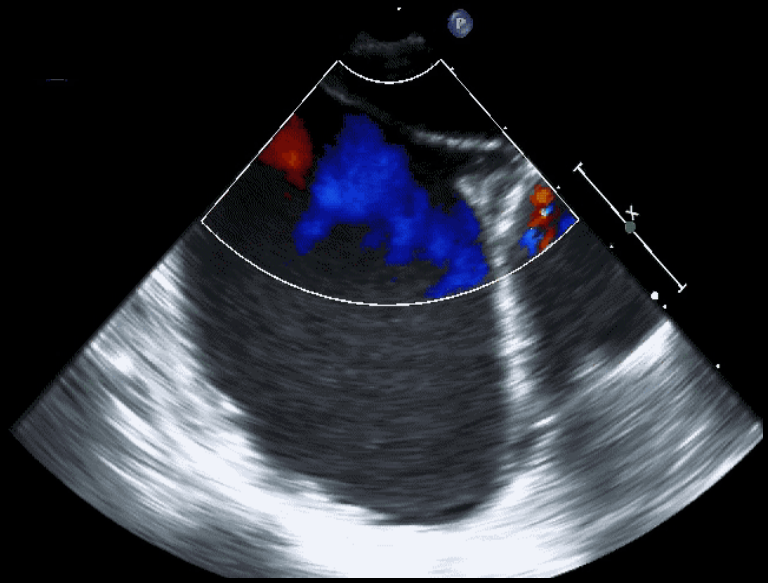
TOE Workup Pre LAA Closure

(rule out other RF for Stroke)

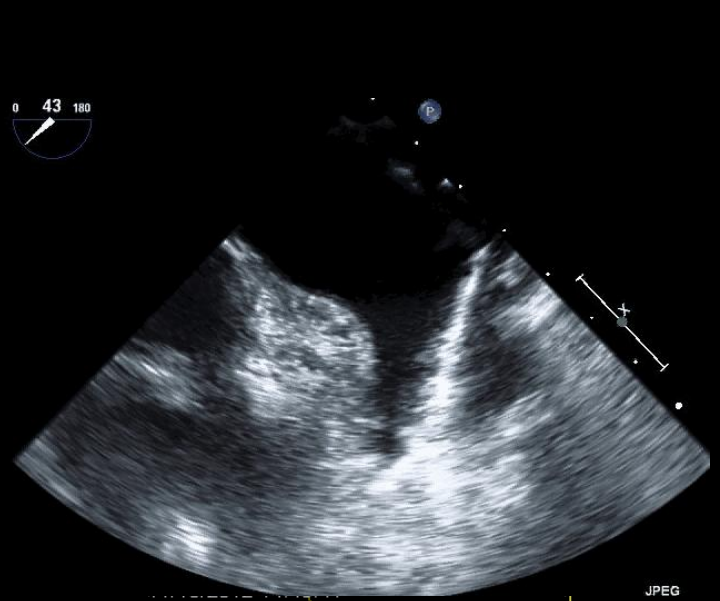
- Pericardial assessment
- Chamber function
- Valvular assessment
- Interatrial septum – identify shunts
- LAA anatomy
- Arch atheroma

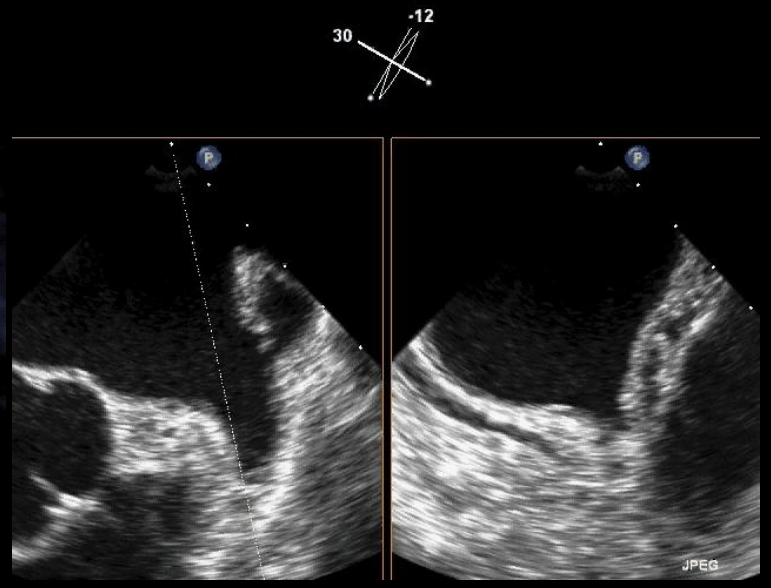


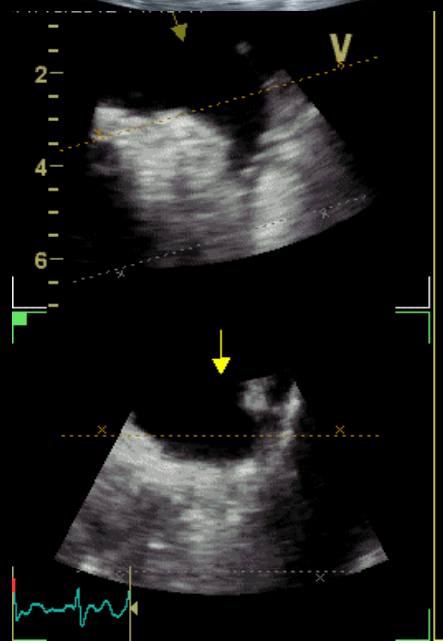


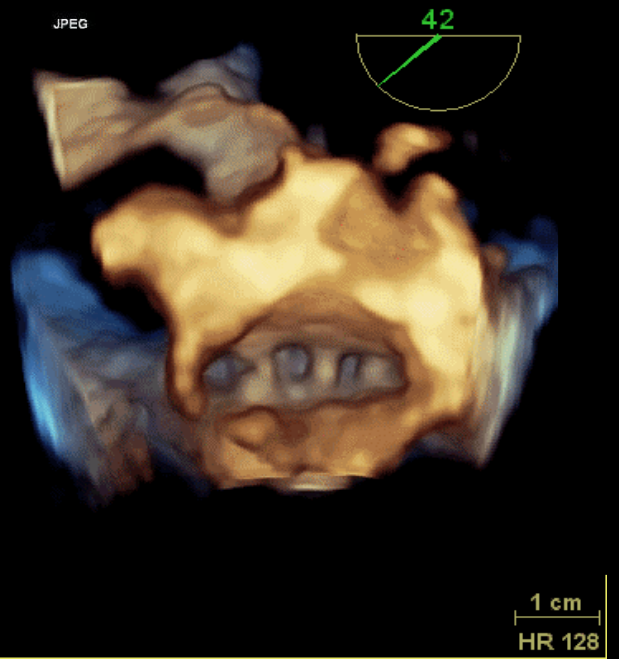


LAA is unique & often complex

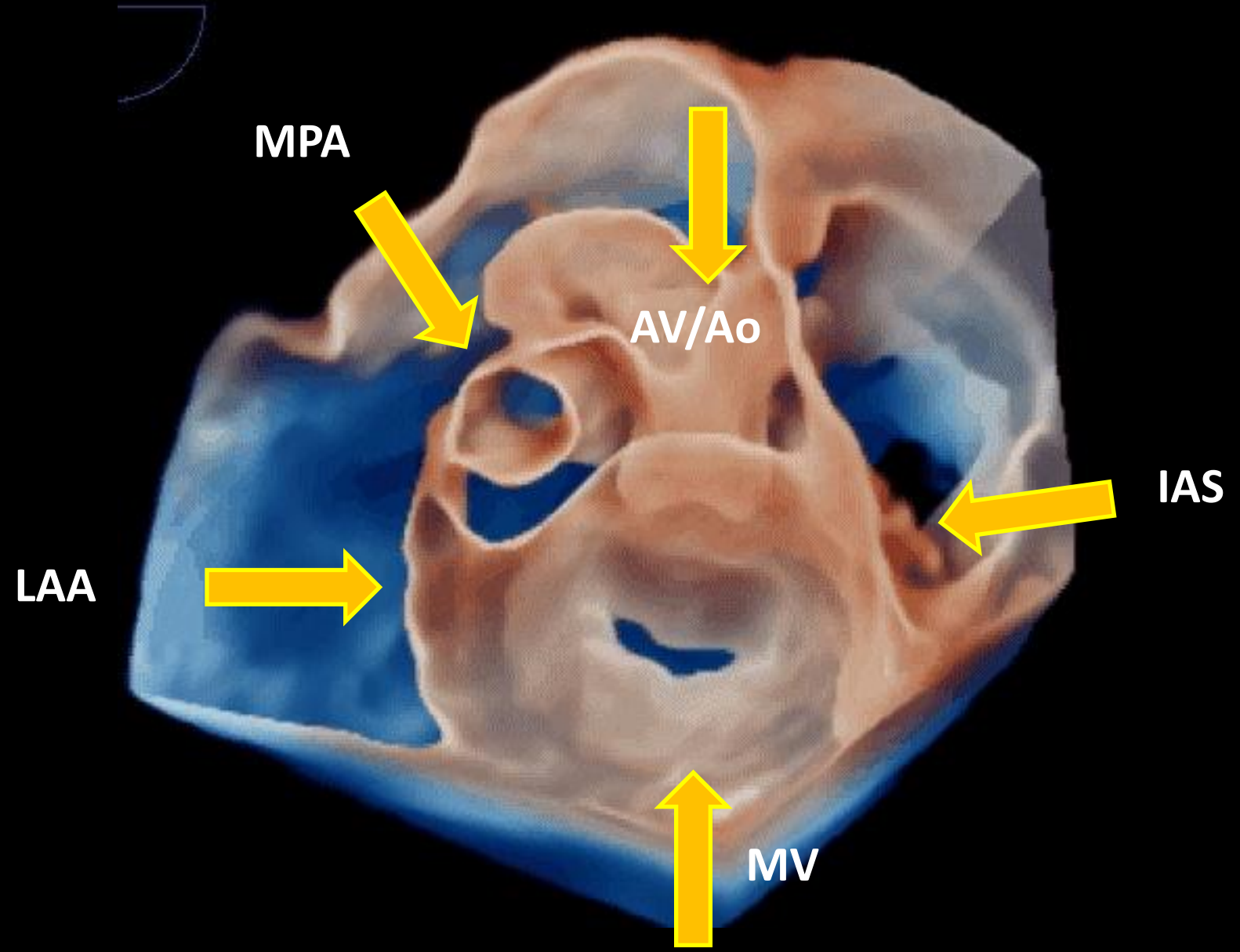




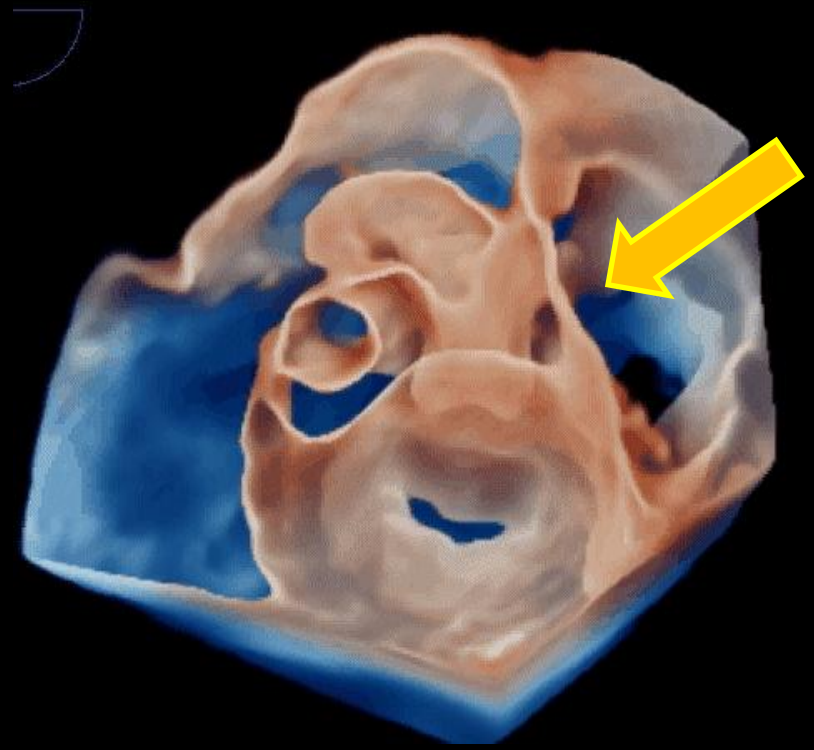


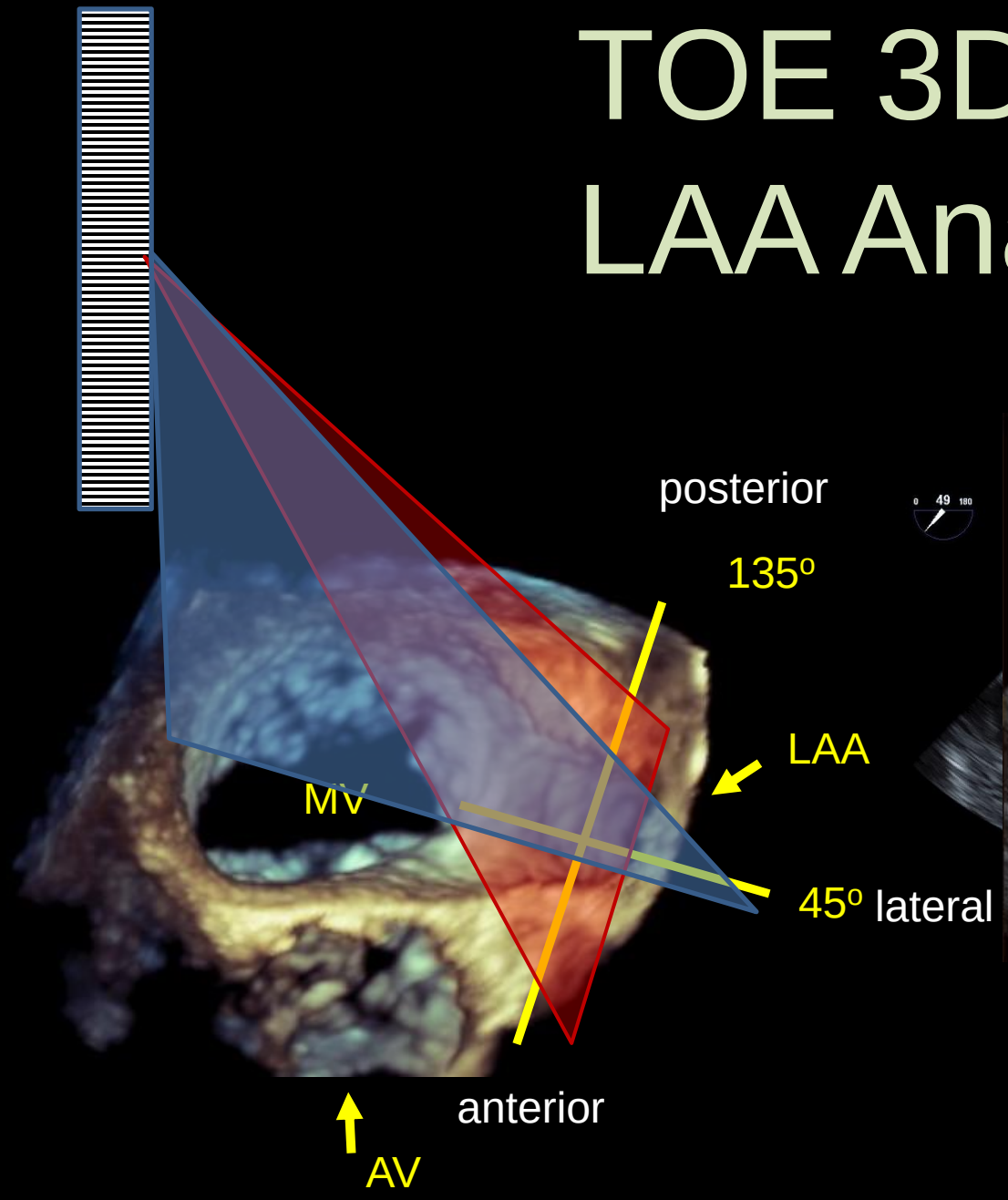


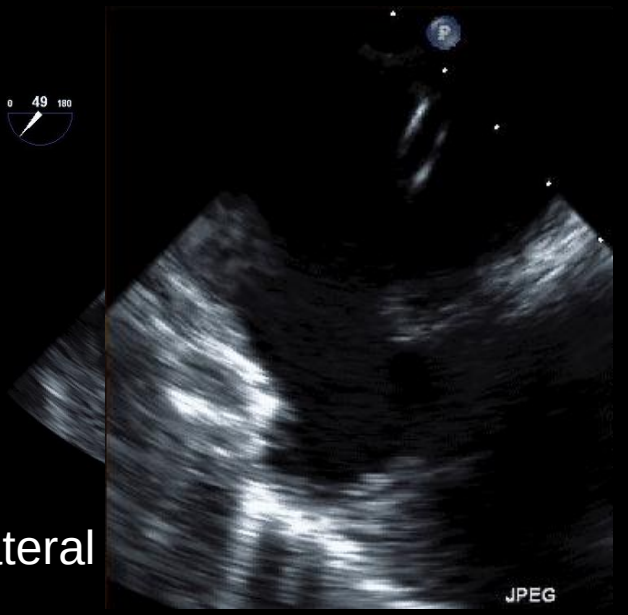
LAA 3D Relationships



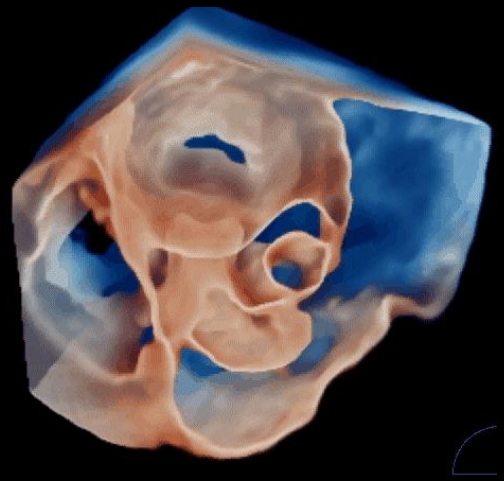
TOE 3D of LAA Anatomy

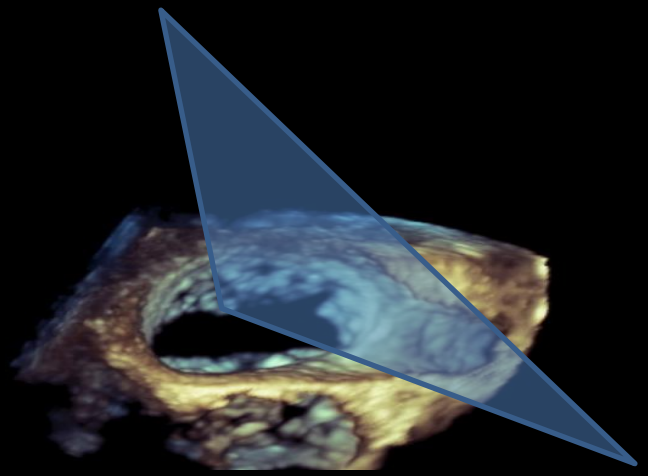




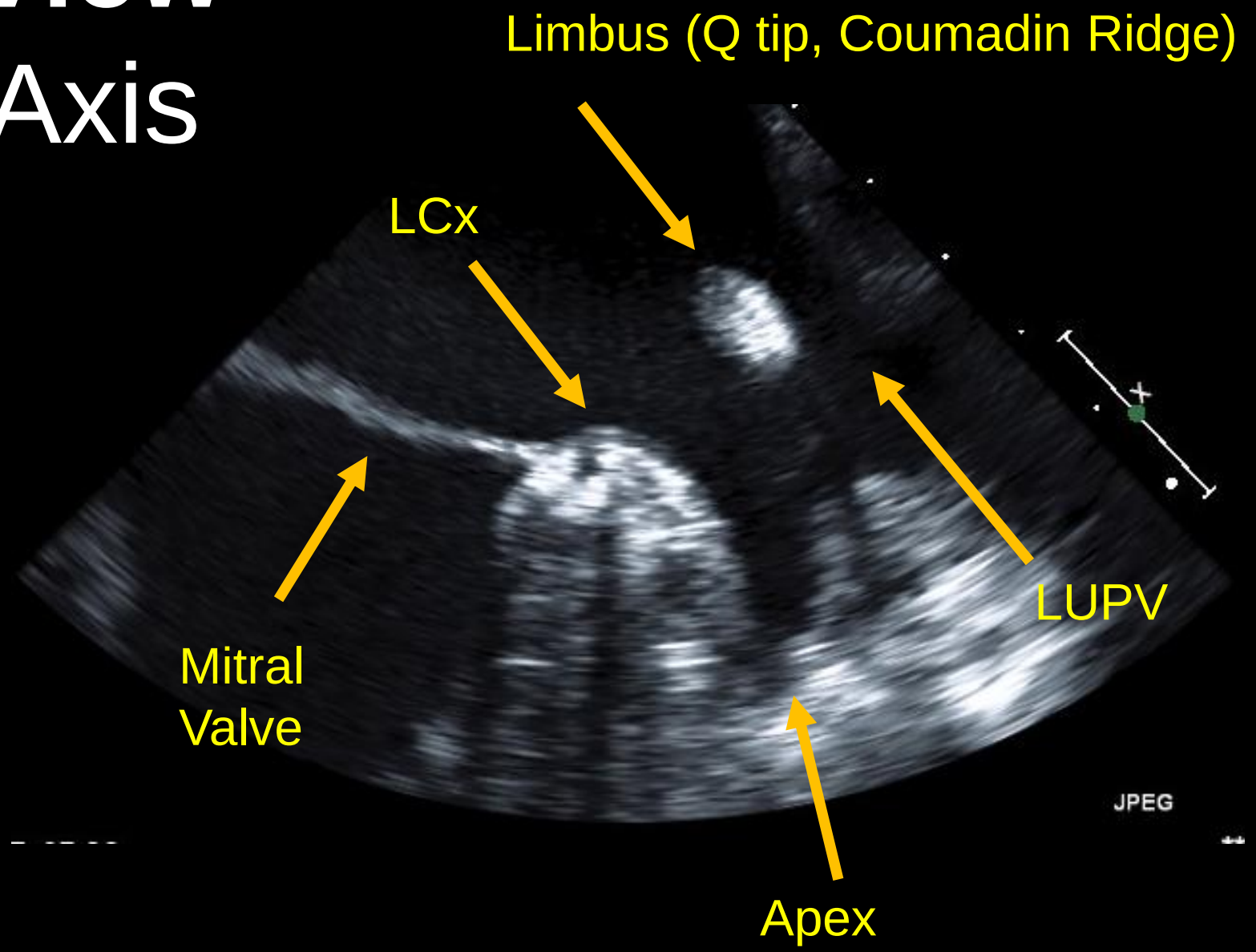


LAA View





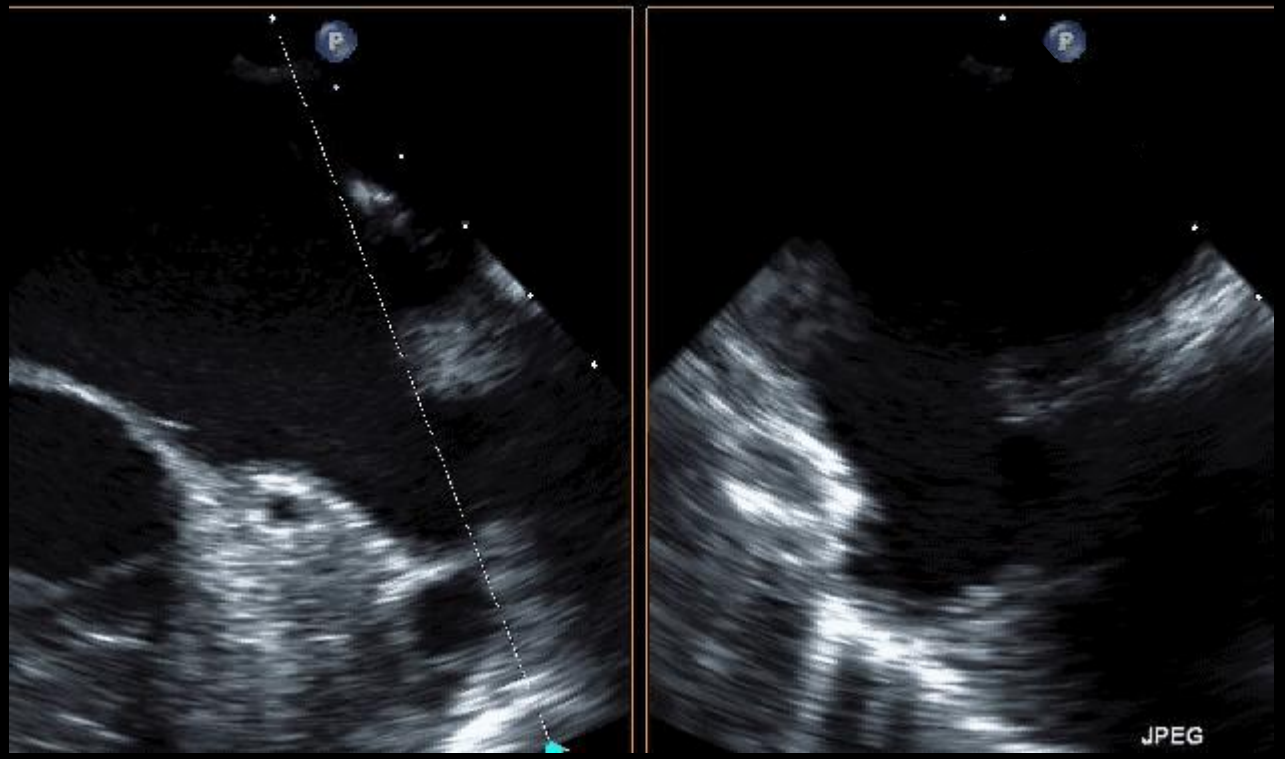
LAA View
Long Axis



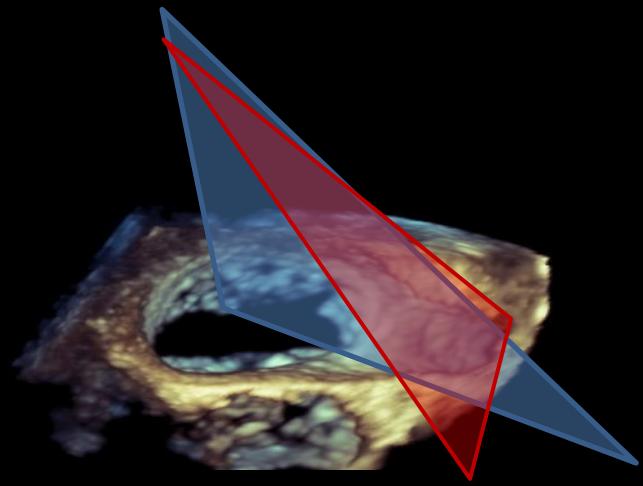
LAA Implant View

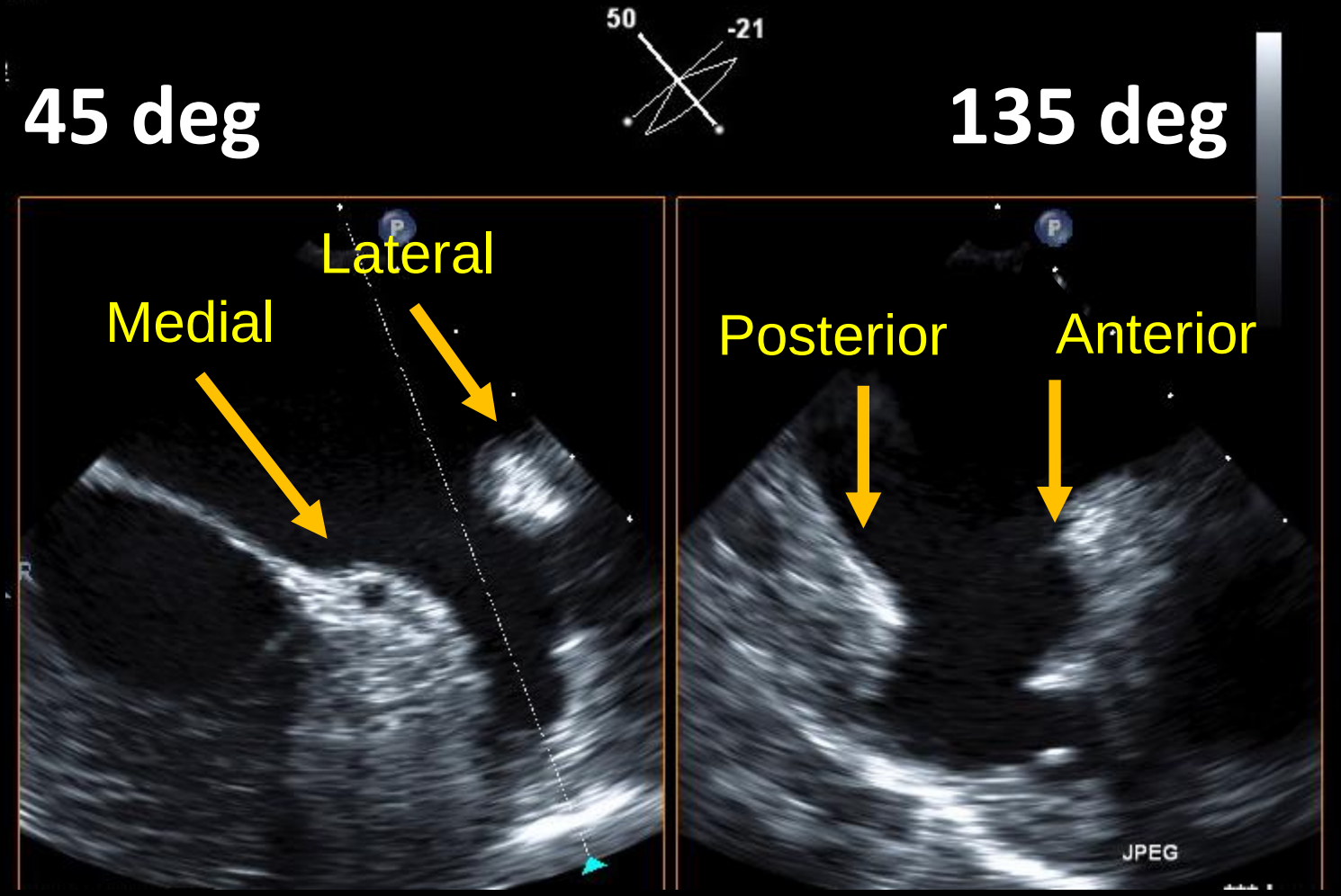
45 deg

135 deg



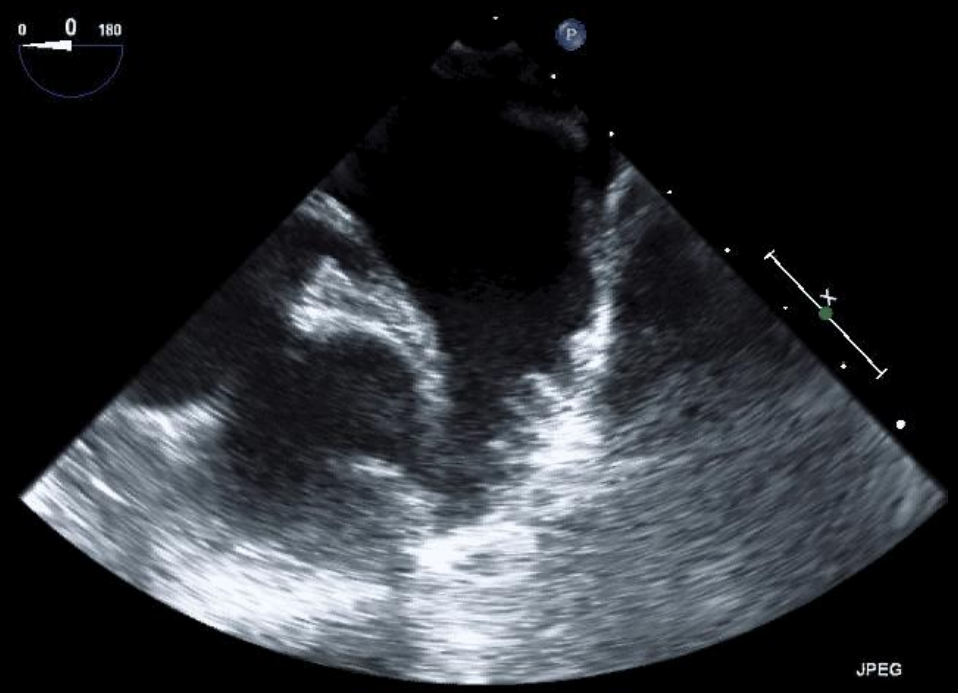
LAA Implant View



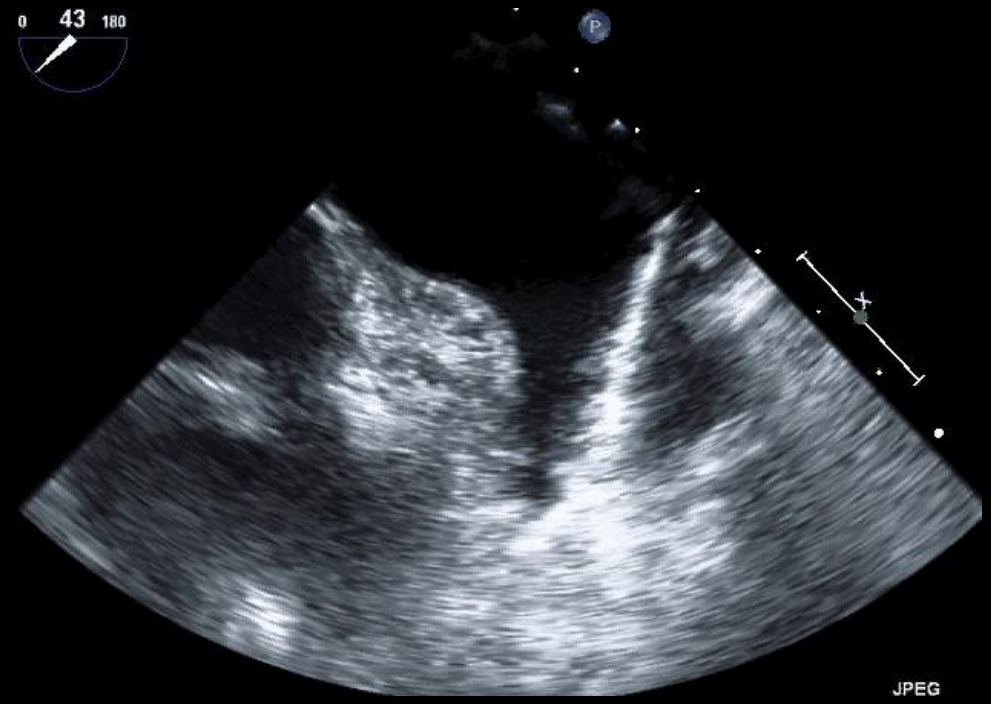


LAA Views & Measurements

0 deg

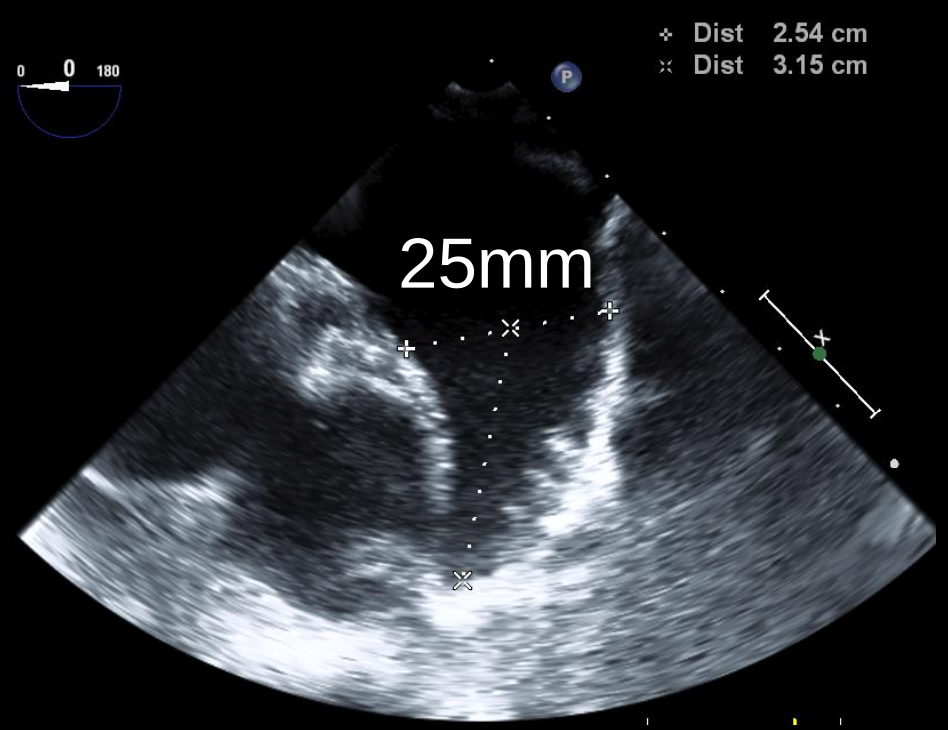


45 deg



LAA Measurements – Landing Zone

0 deg



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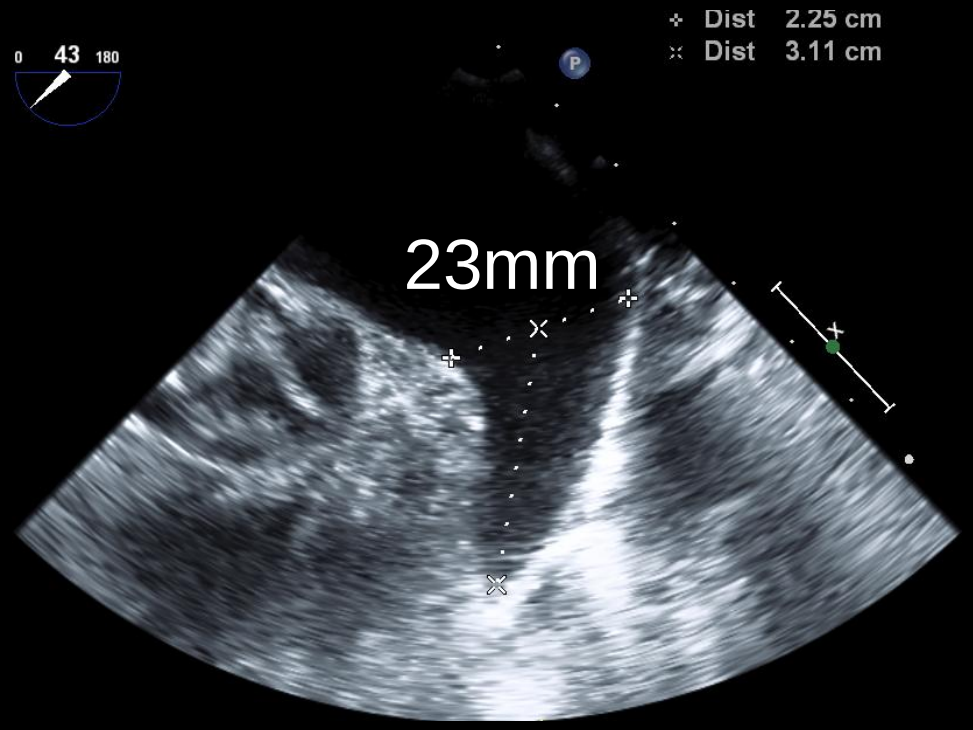
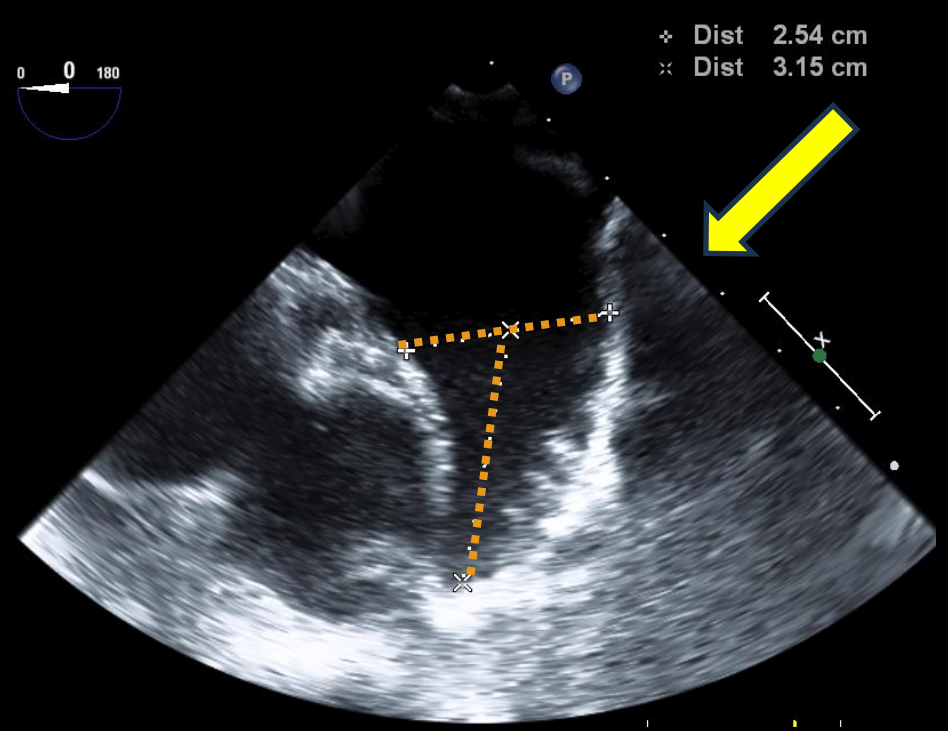


Landmarks – LCx to 1-2cm from Limbus

LAA Measurements – Landing Zone

0 deg



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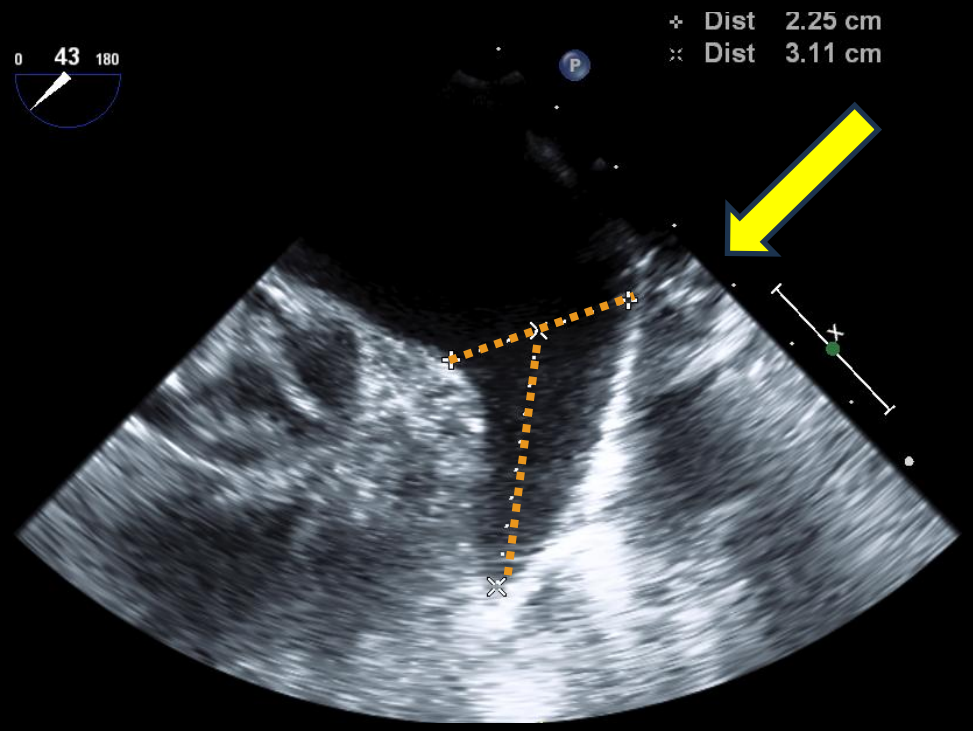
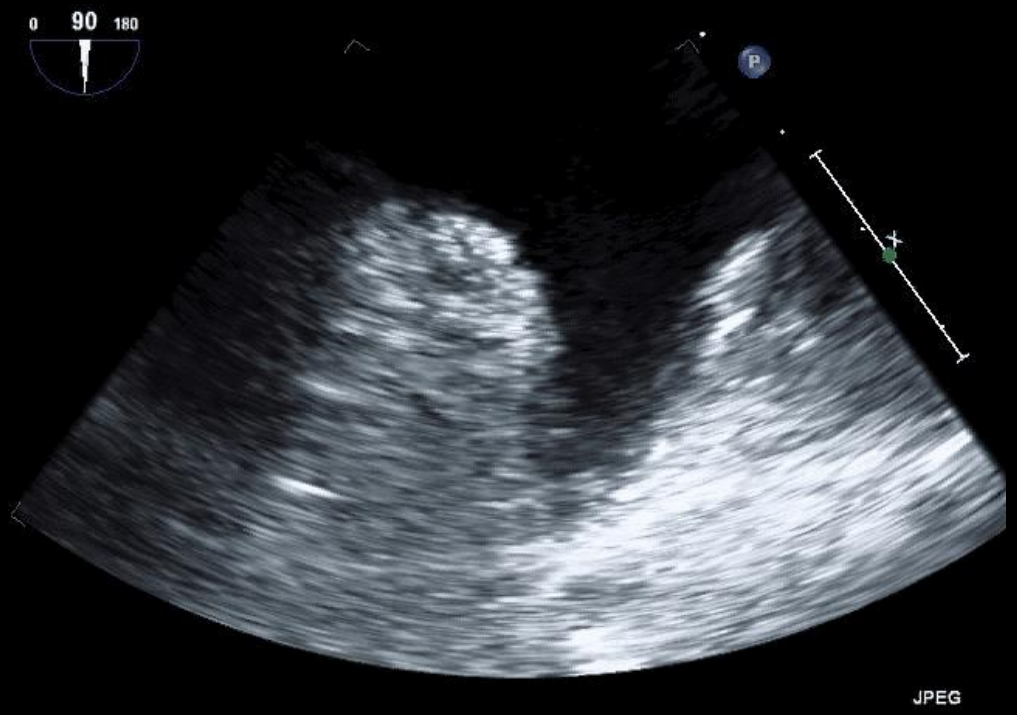


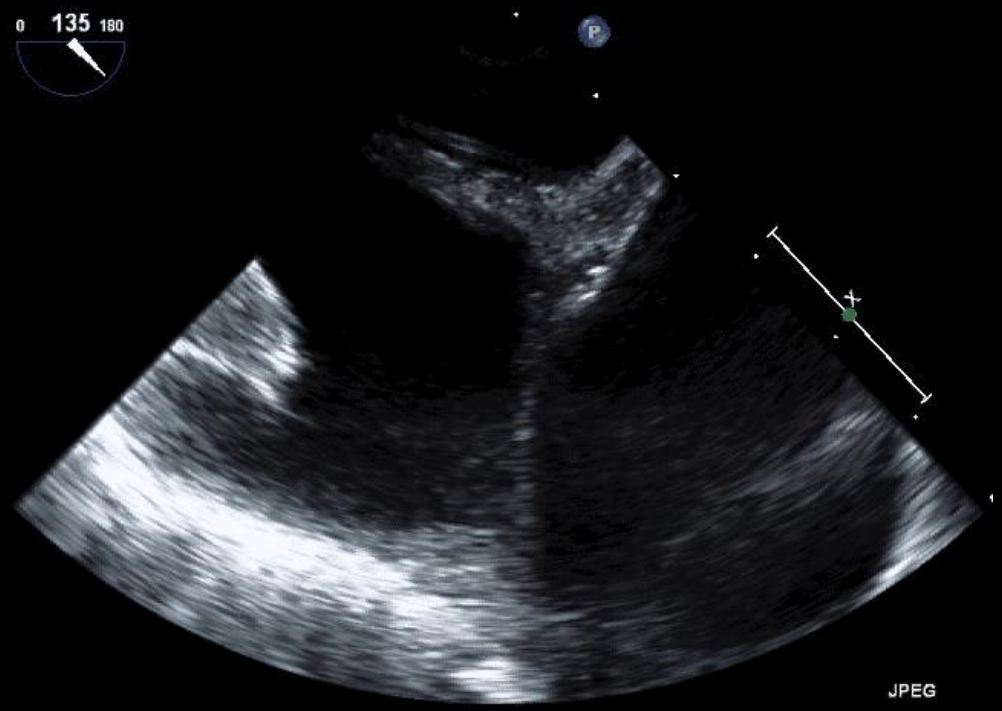
Landmarks – LCx to 1-2cm from Limbus

LAA Views & Measurements

90 deg

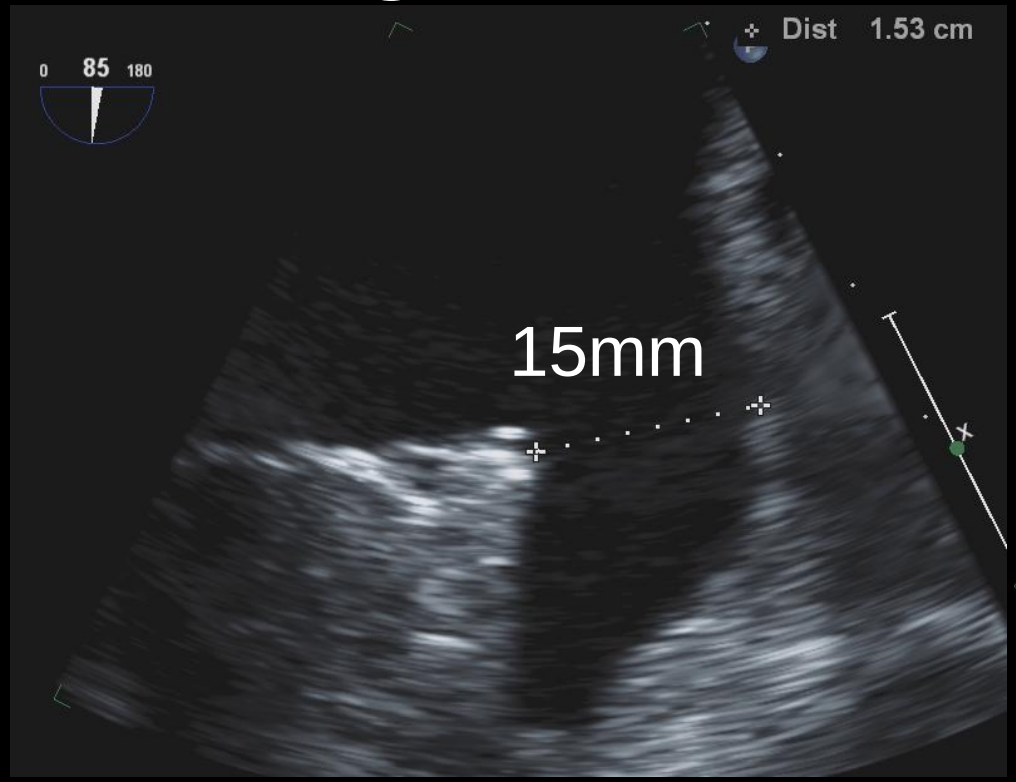


135 deg



LAA Measurements – Landing Zone

90 deg



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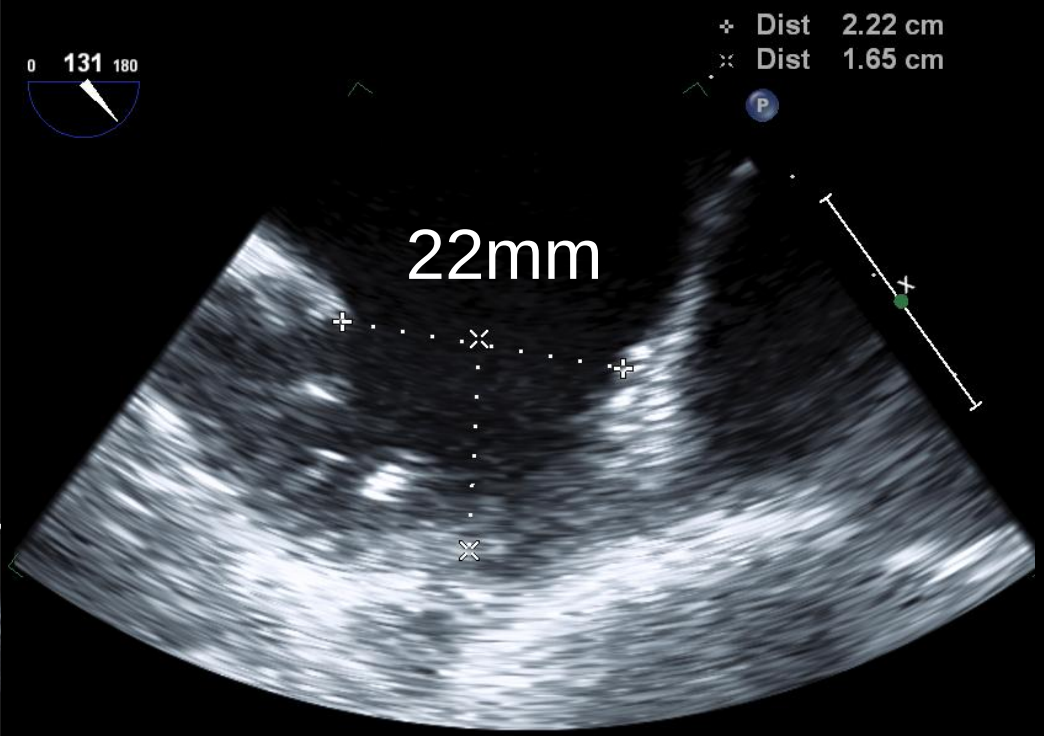
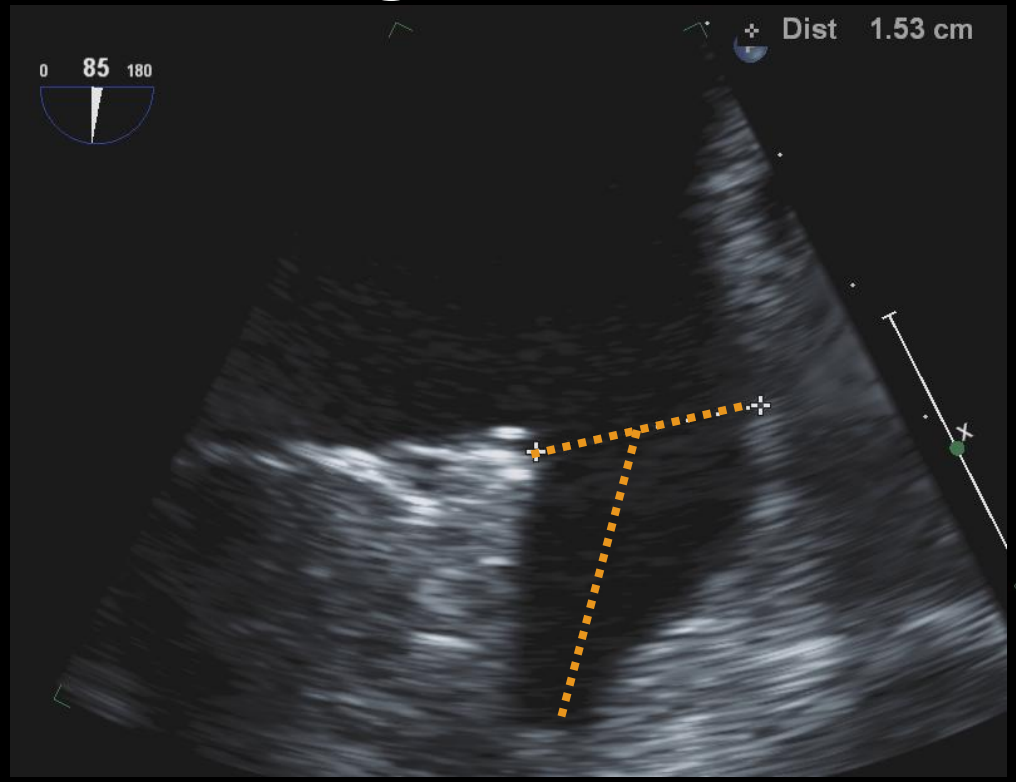


LAA Measurements – Landing Zone

90 deg



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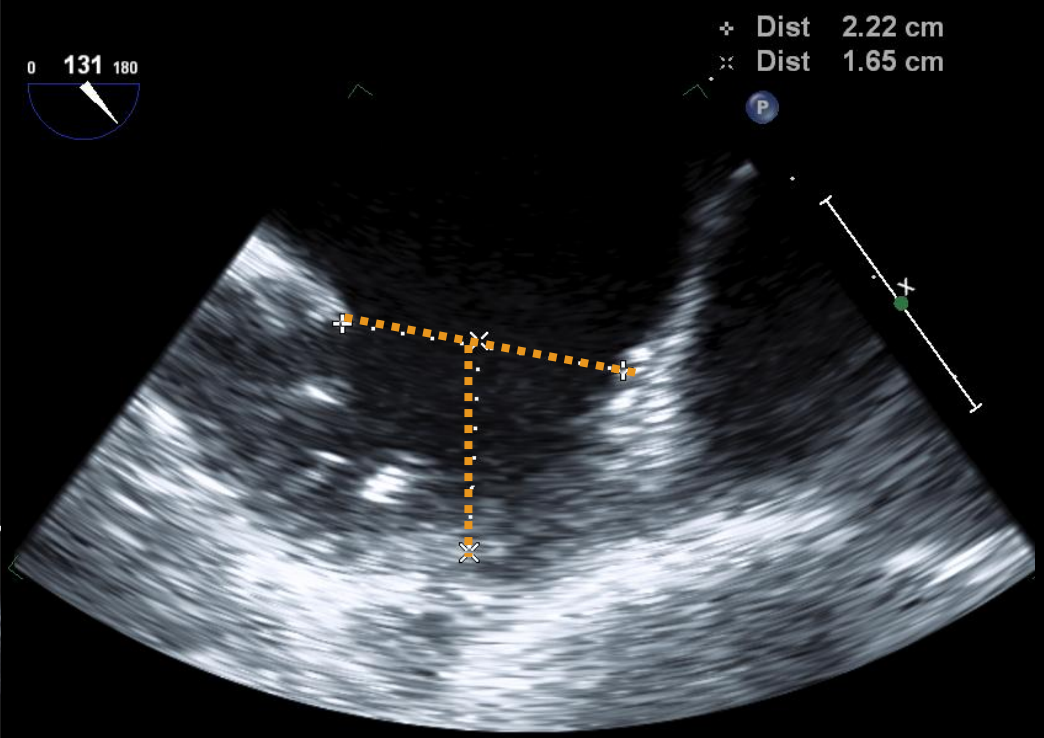
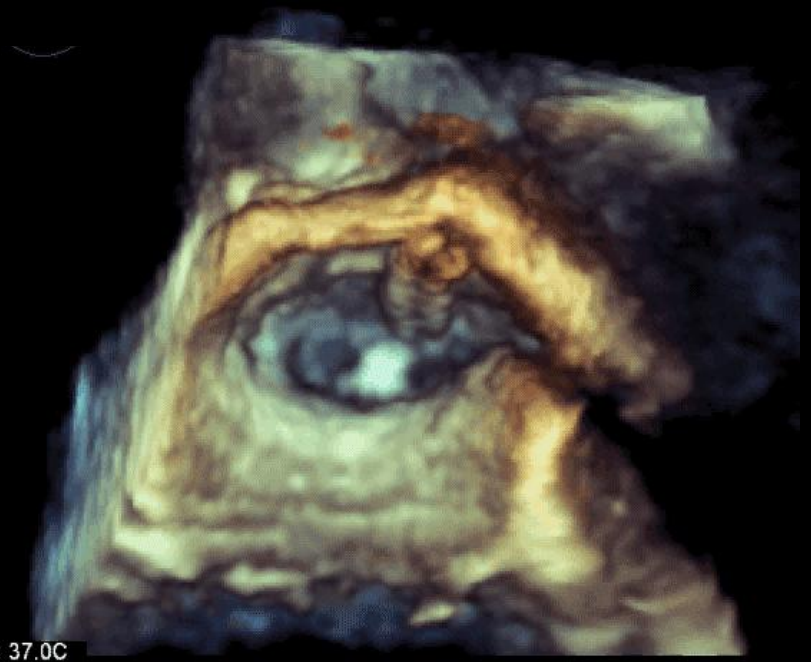


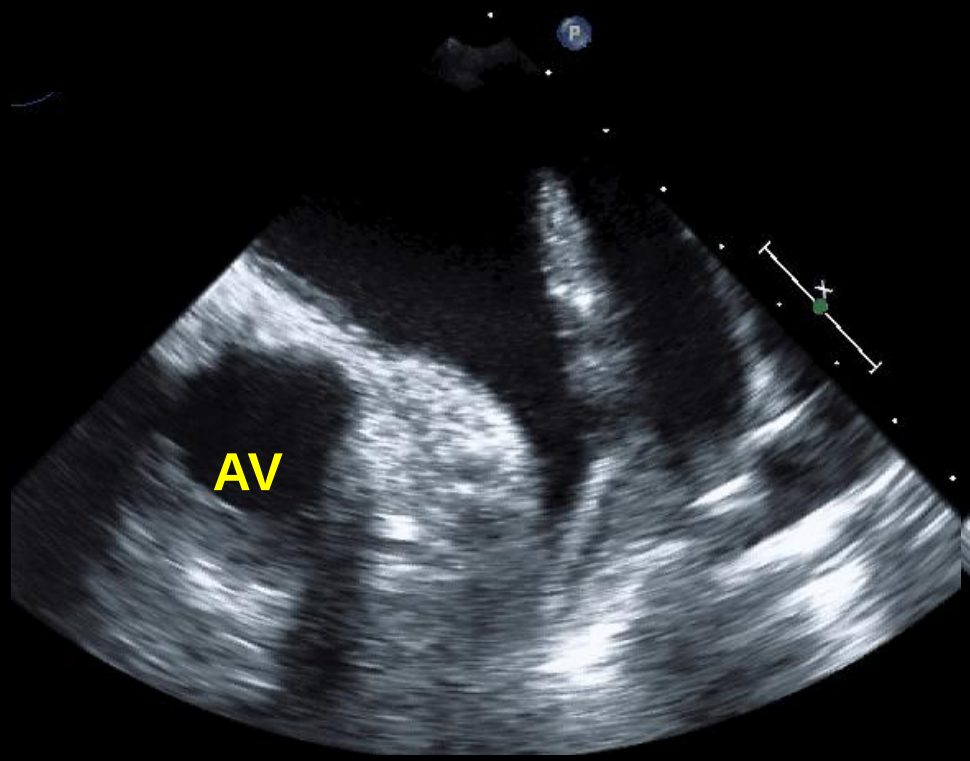
Useful LAA Anatomical Information from TOE



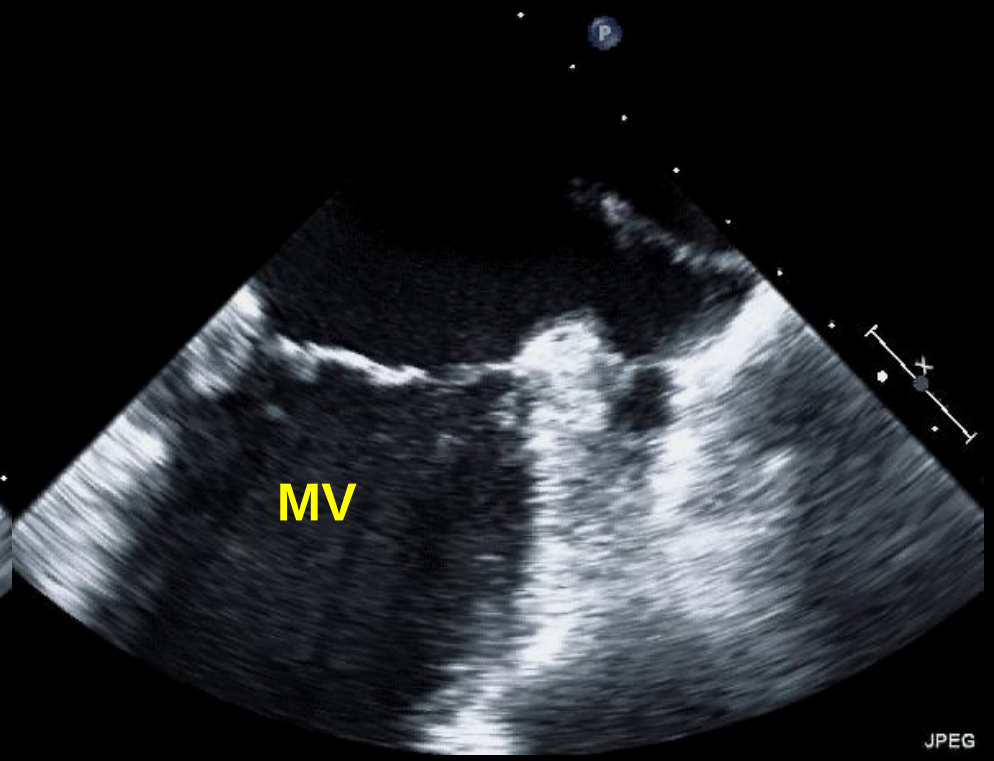
- Device “landing zone”
- Number of lobes/accessory lobes
- Interatrial septum landmarks
- LAA orientation
  - Anterior vs. Lateral

LAA Orientation

Anterior

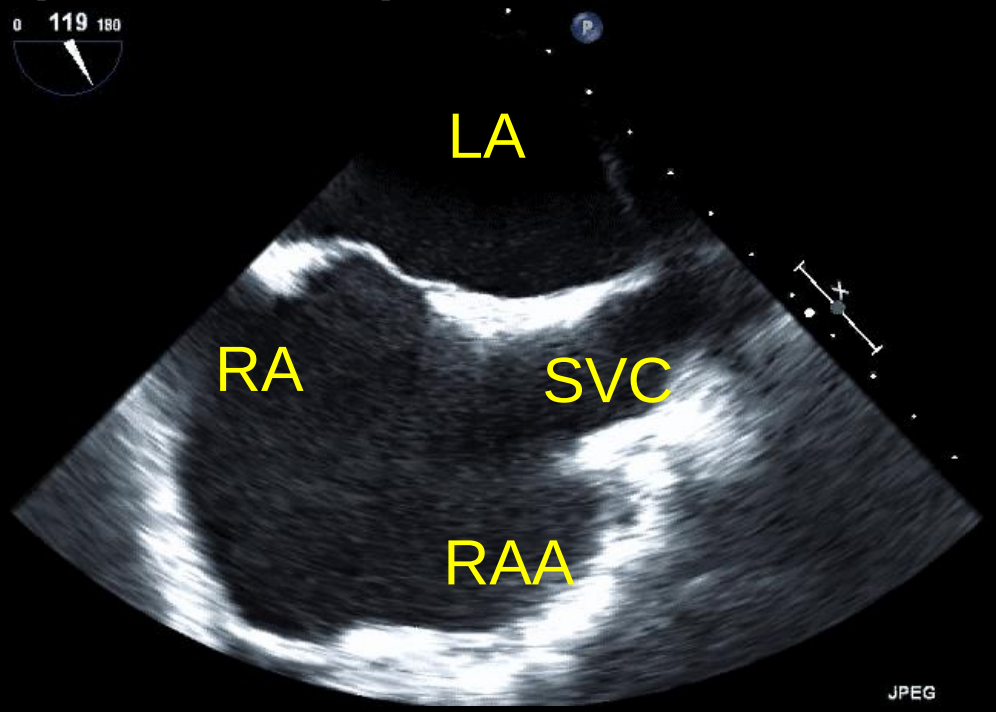


Lateral

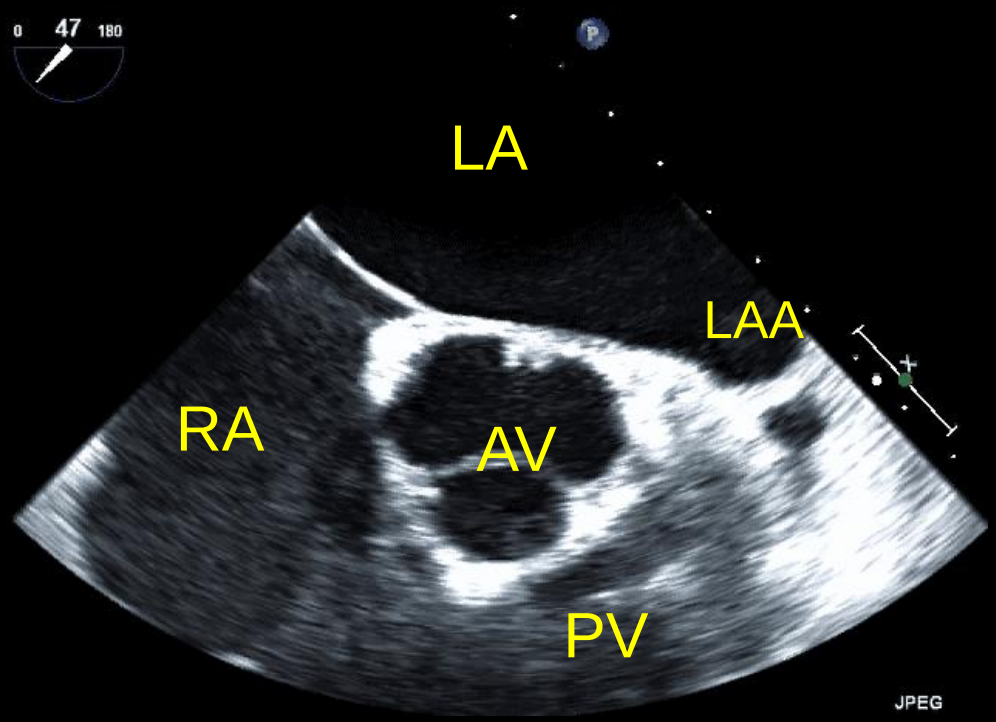


Interatrial Septal Anatomy

Bicaval view (SI)
(90-100º)

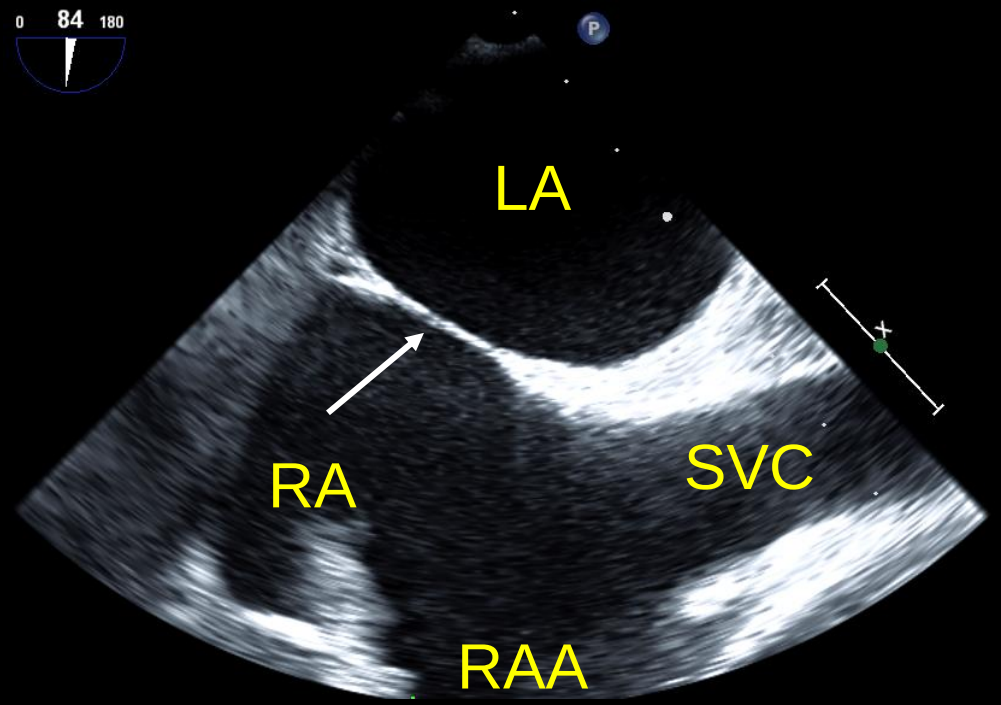


Short axis view (AP)
(35 -50º)



Trans-Septal Puncture Landmarks

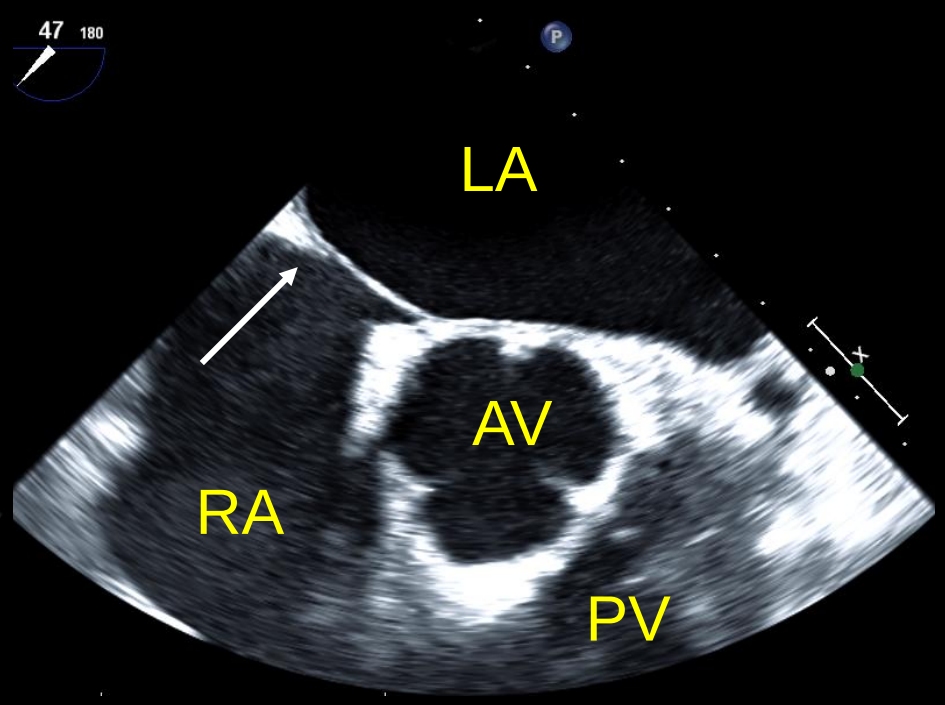
Bicaval view
(90-100º)



Mid position

Supero-inferior

Short axis view
(35 -50º)



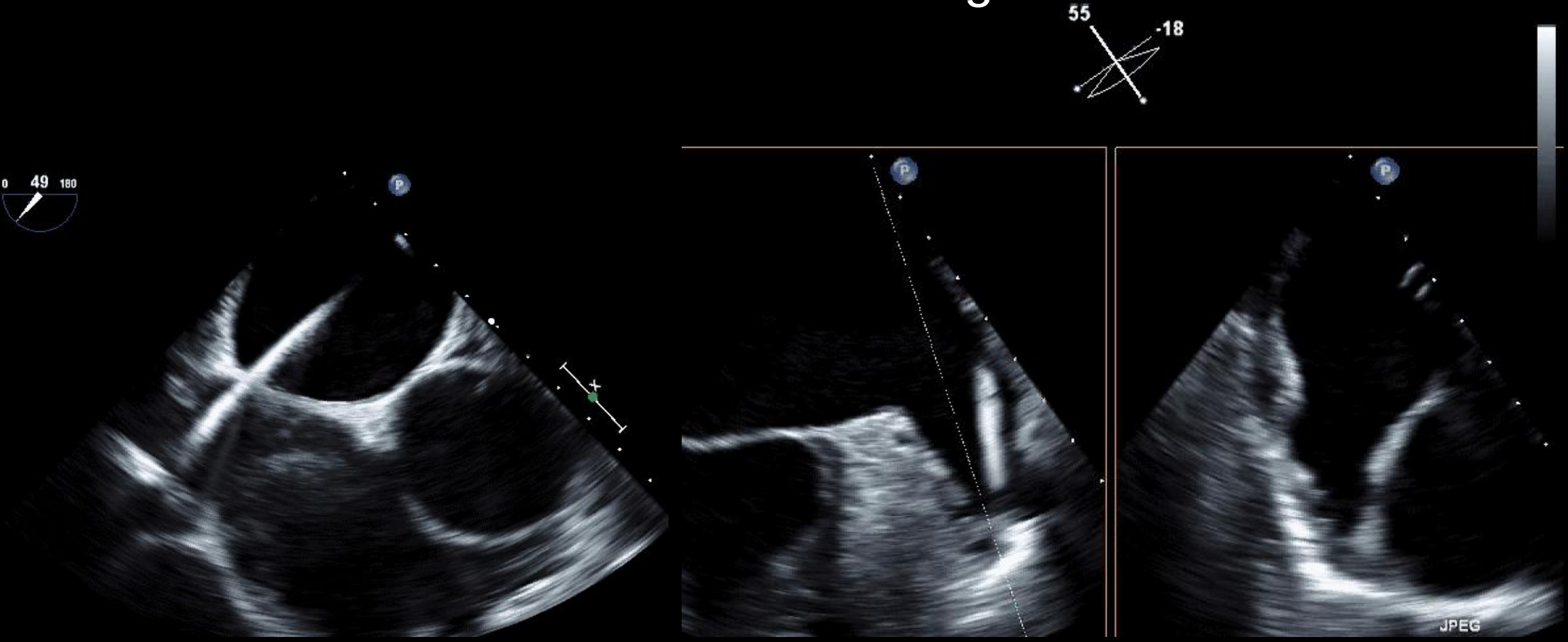
Posterior position

Antero-posterior

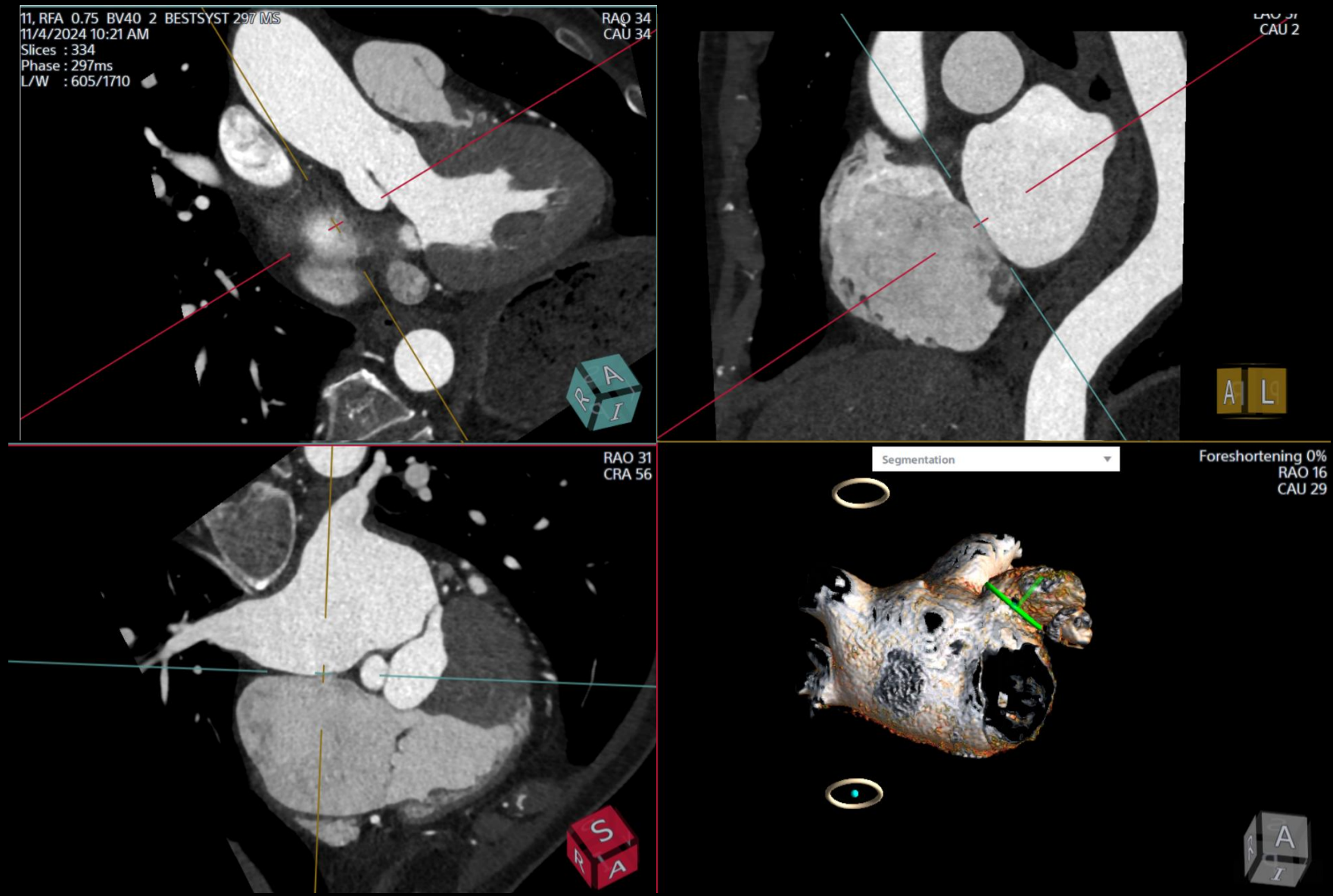
Trans-Septal Puncture

Sheath Positioning

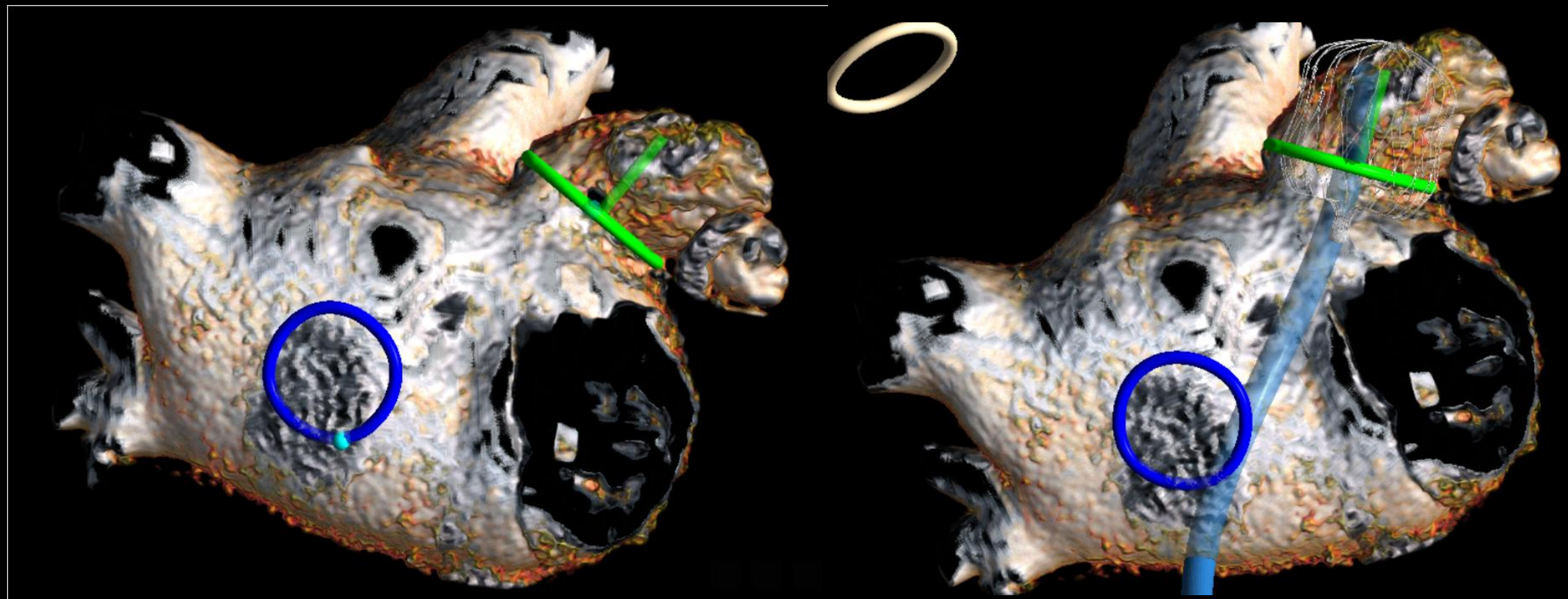
Posterior Puncture allows Coaxial Alignment of Sheath



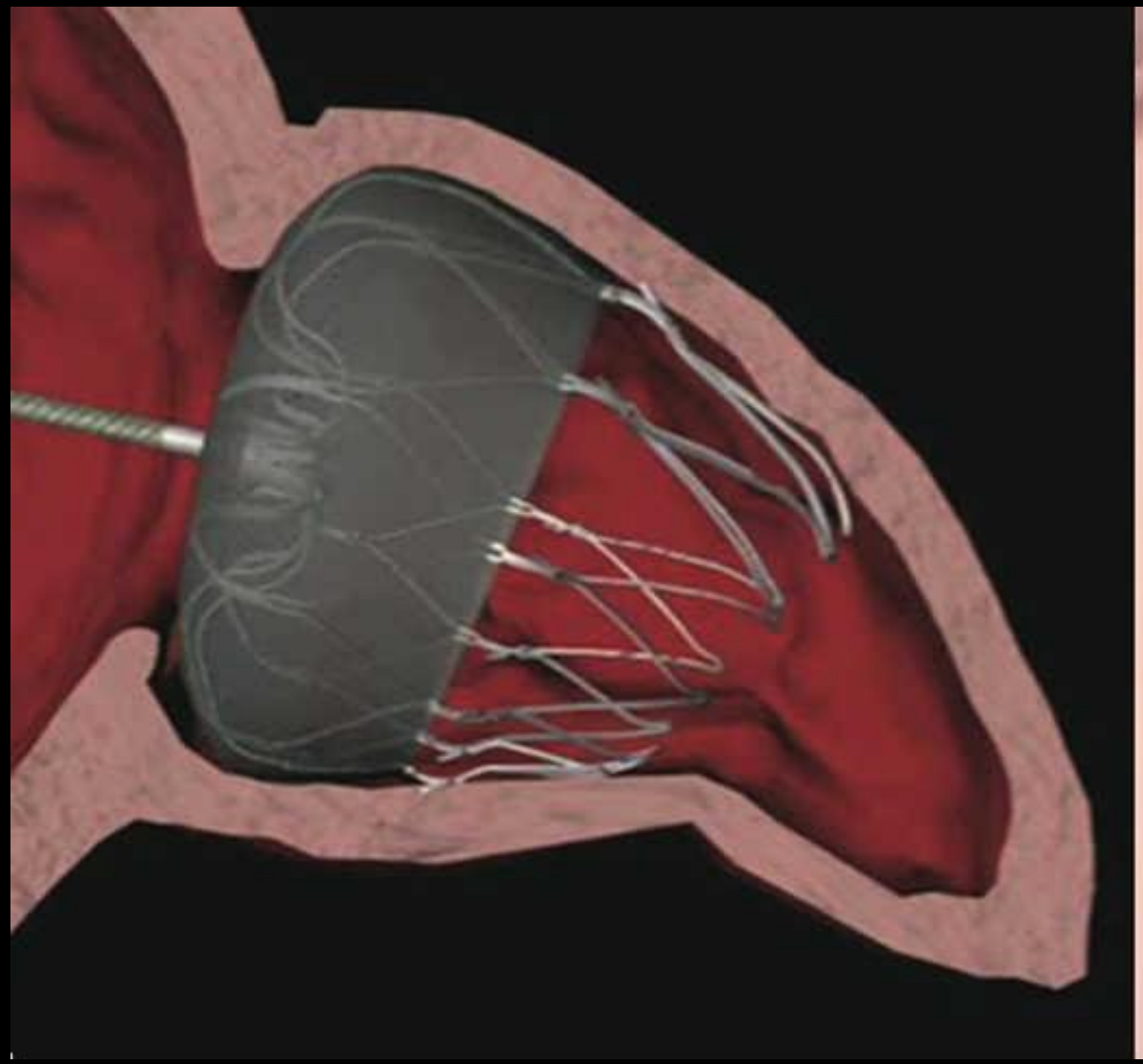
Use of CT for Procedural Planning



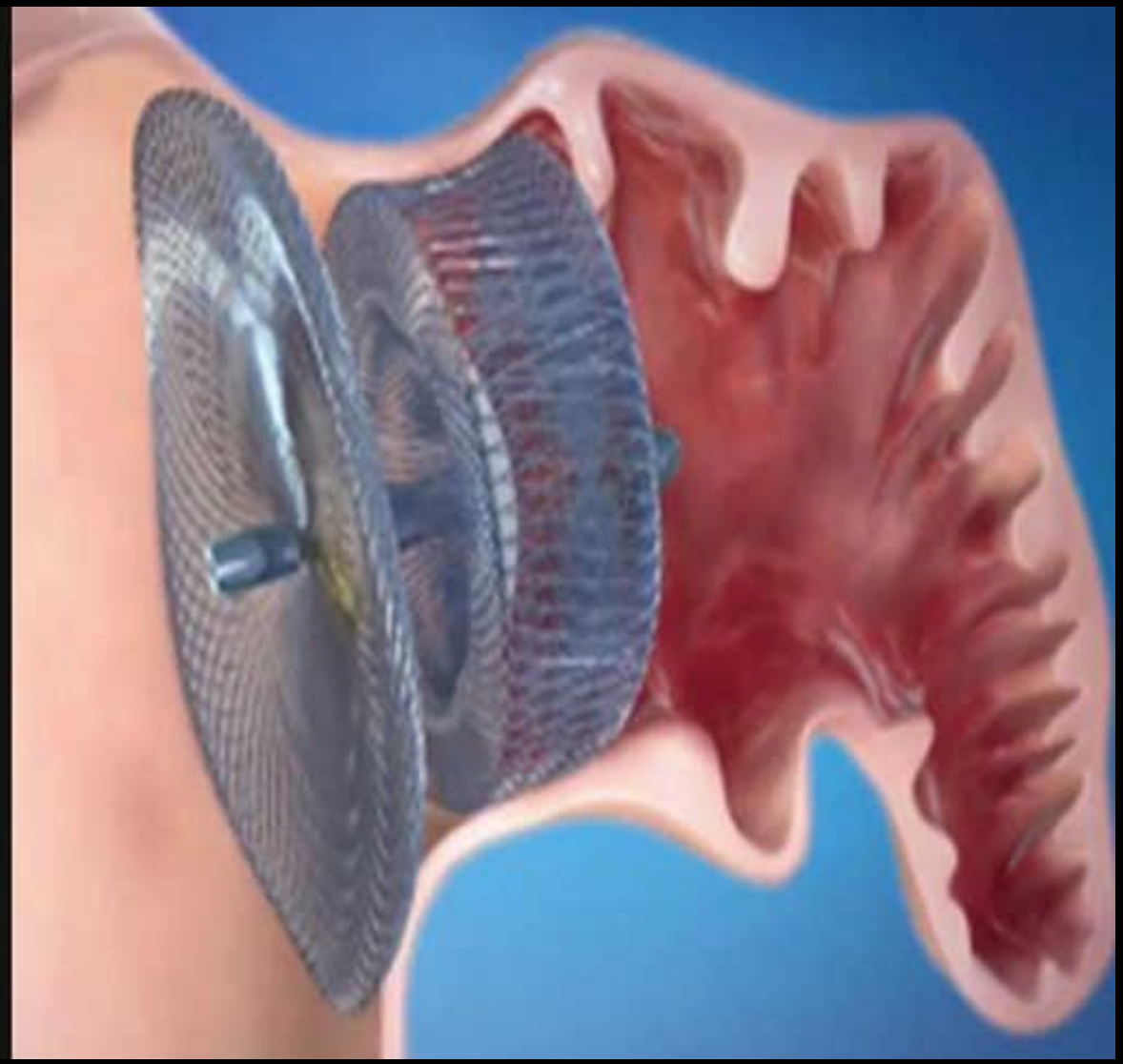
Use of CT for Procedural Planning



Watchman

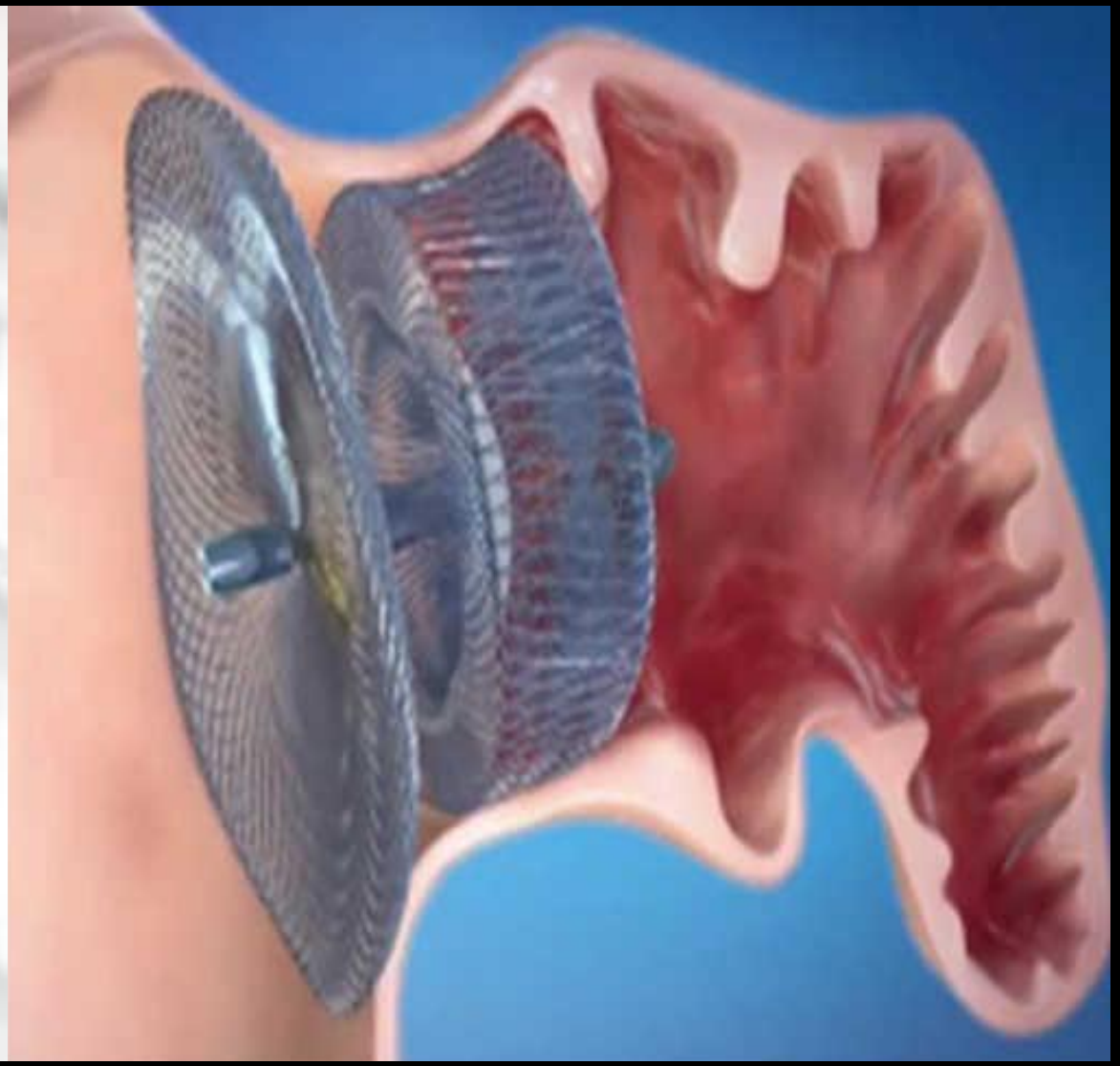


Amulet

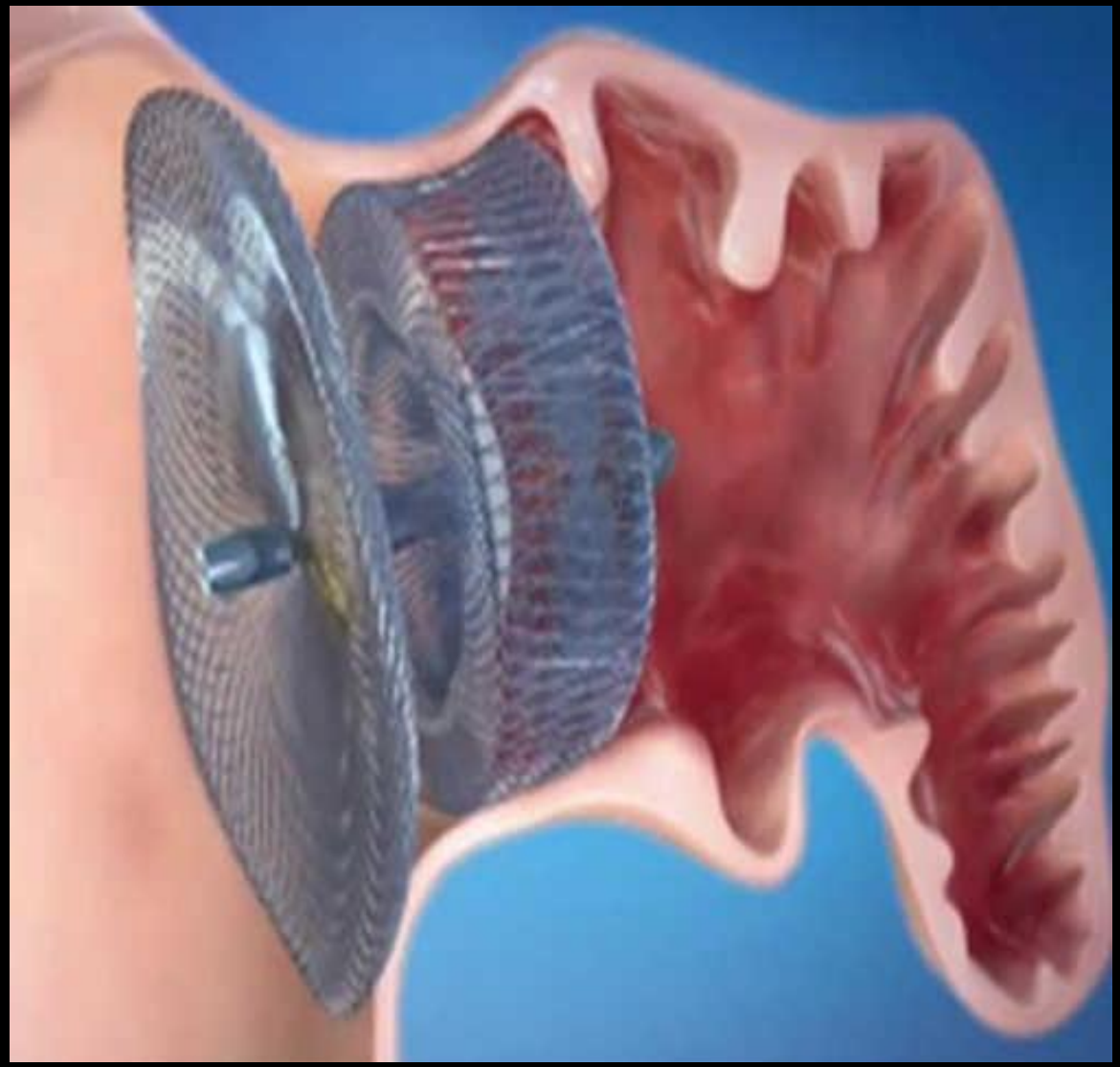


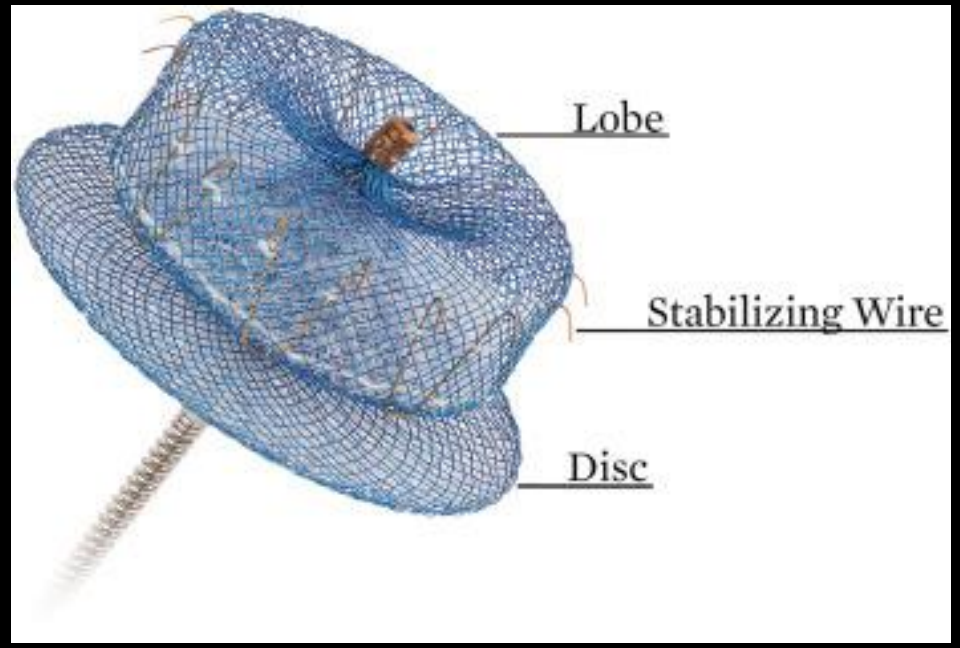
Watchman

Amulet

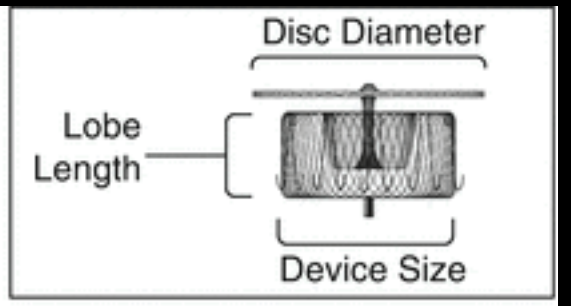


Amulet



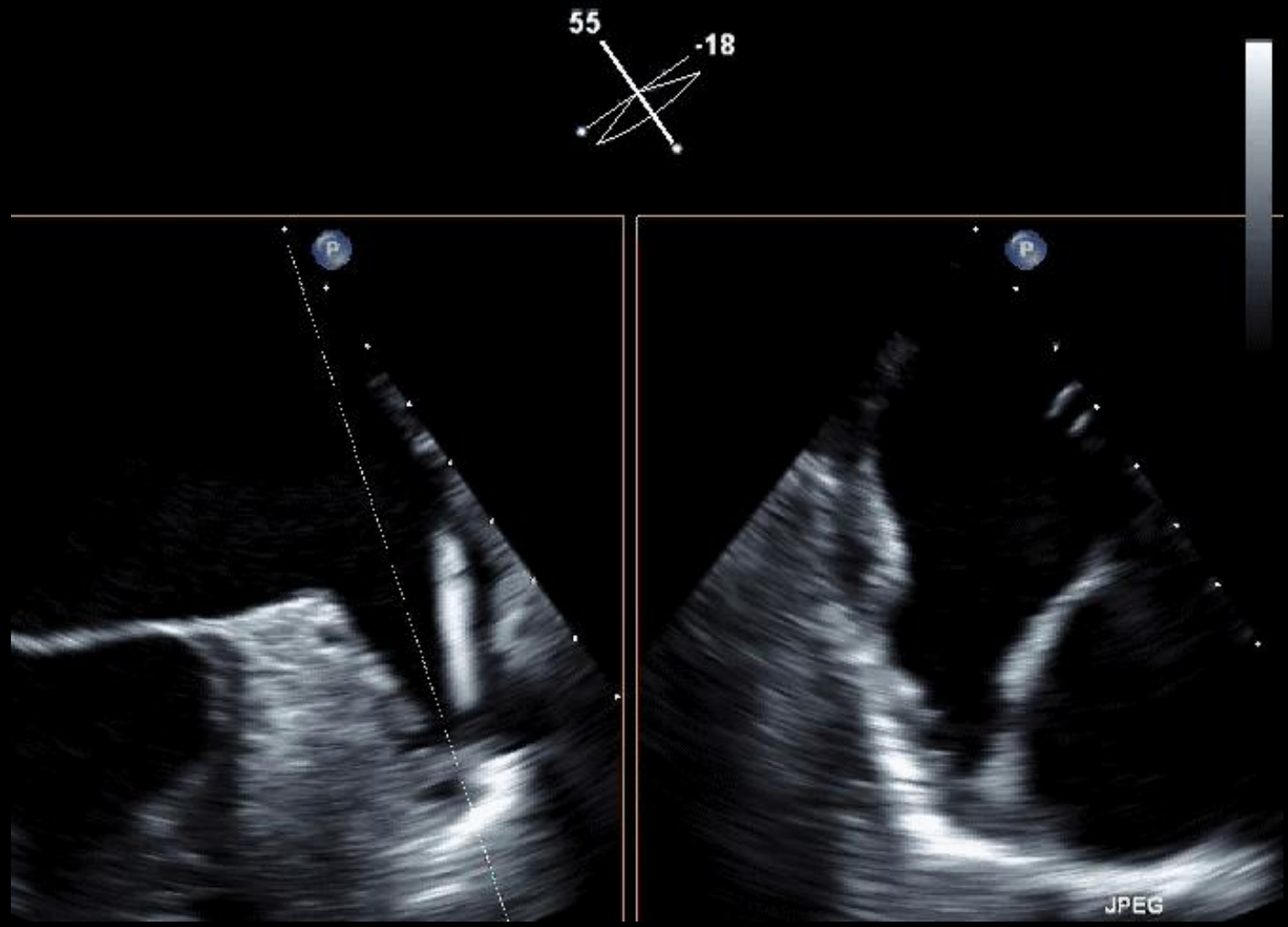


AMPLATZER AMULET SIZING CHART

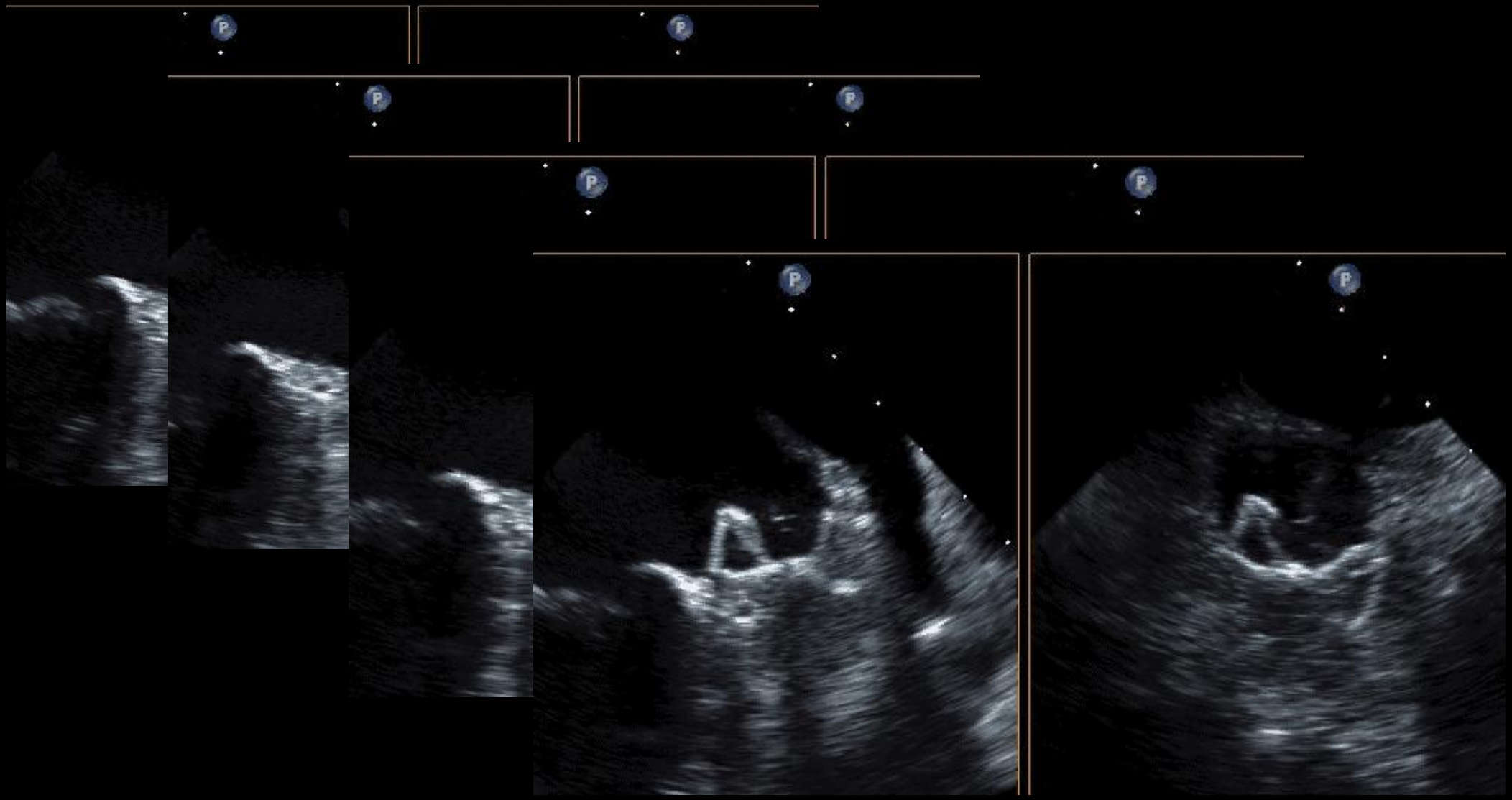


Maximum Landing Zone Width (mm)	Amulet™ Device Size	Lobe Length (mm)	Minimum LAA Depth (mm)	Disc Diameter (mm)	Sheath Diameter
11.0 – 13.0	**16**	7.5	≥10	22	12 F *or* 14 F (with adaptor)
13.0 – 15.0	**18**	7.5	≥10	24	
15.0 – 17.0	**20**	7.5	≥10	26	
17.0 – 19.0	**22**	7.5	≥10	28	
19.0 – 22.0	**25**	10	≥12	32	
22.0 – 25.0	**28**	10	≥12	35	14 F
25.0 – 28.0	**31**	10	≥12	38	
28.0 – 31.0	**34**	10	≥12	41	

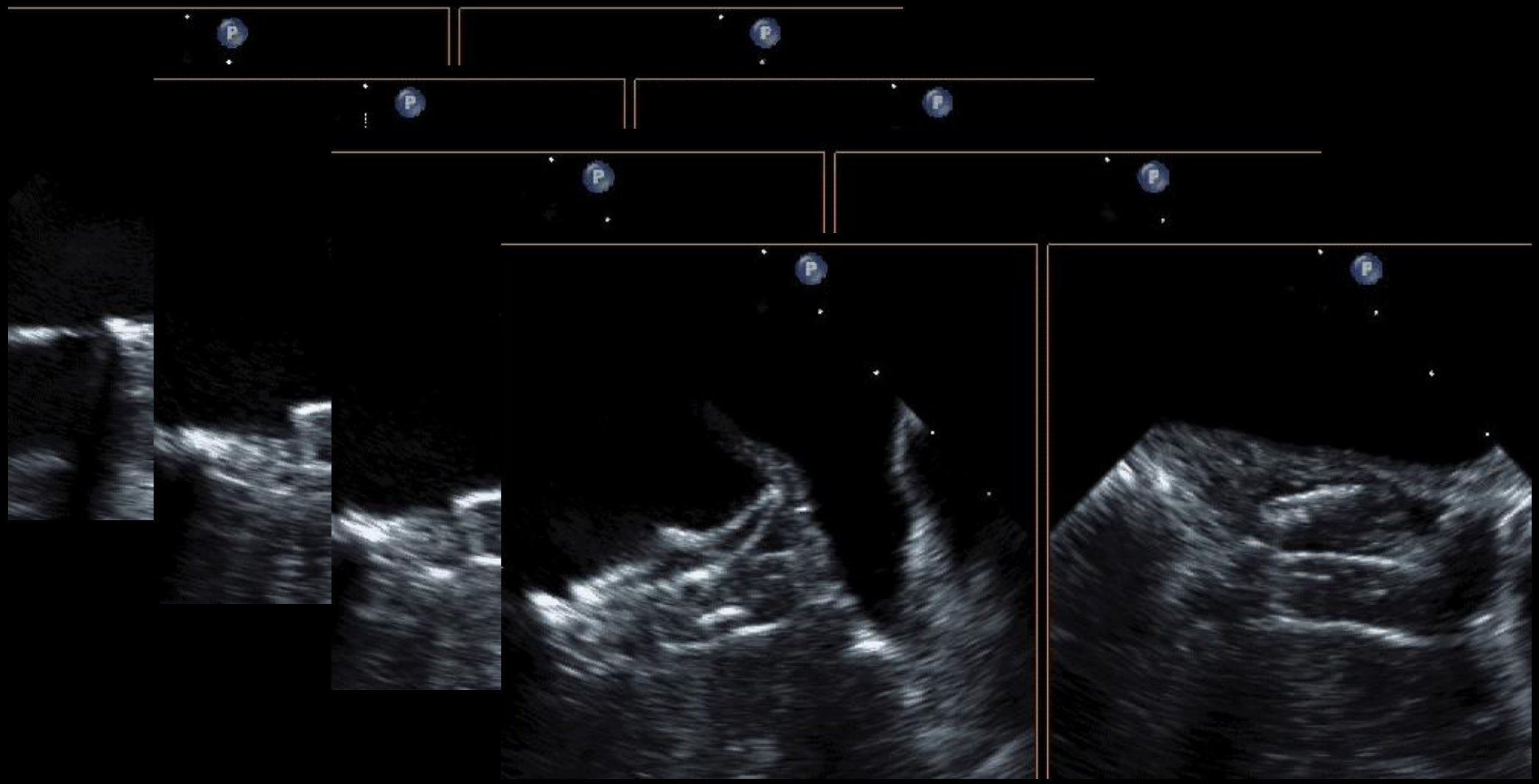
Coaxial Sheath



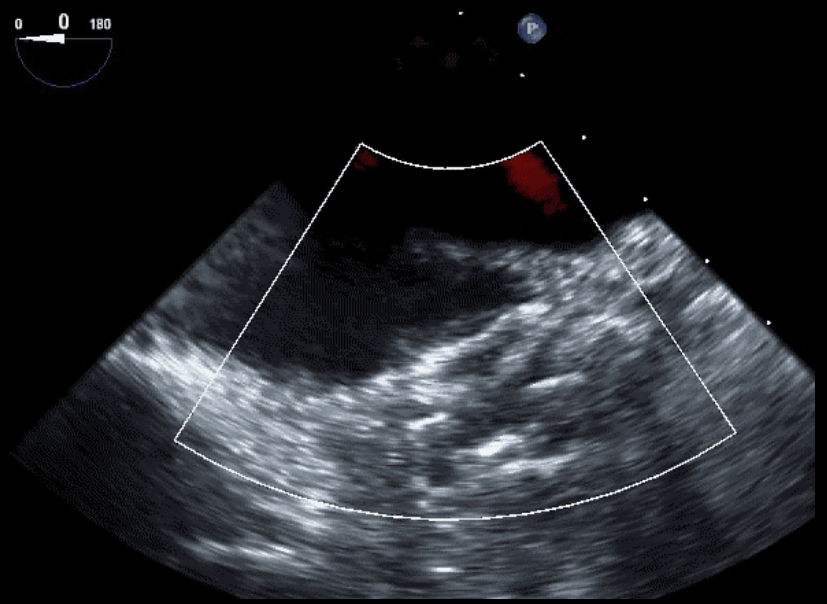
Amulet Implant Stages

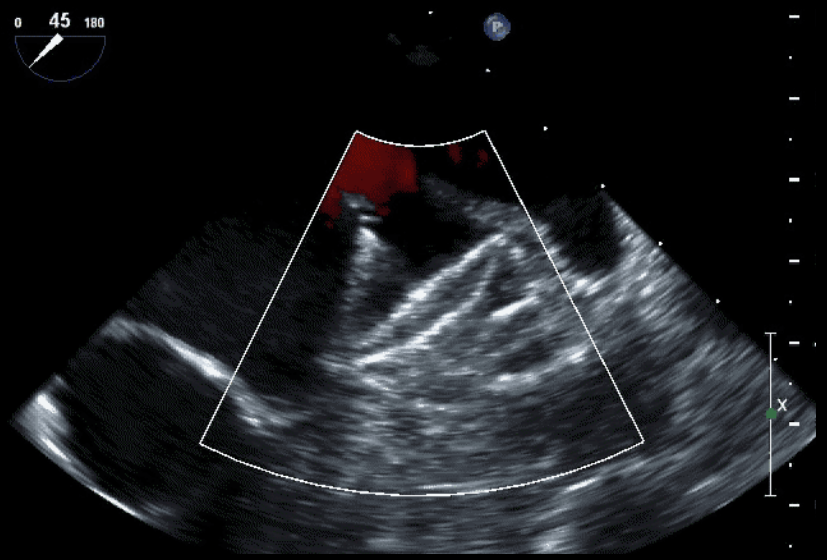


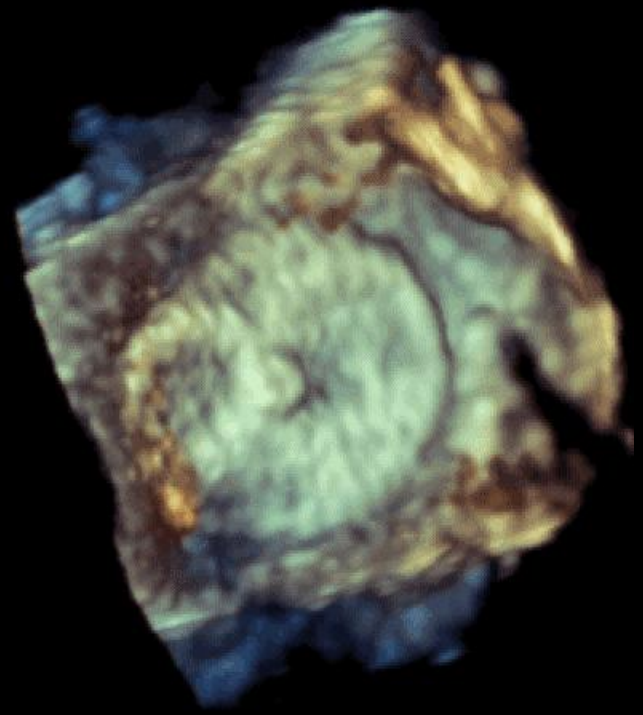
Amulet Implant Stages

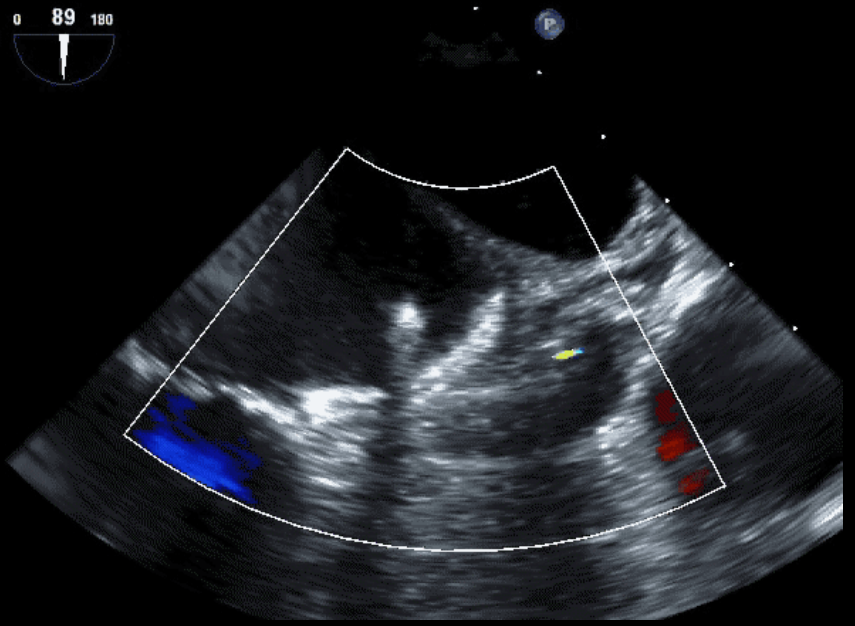


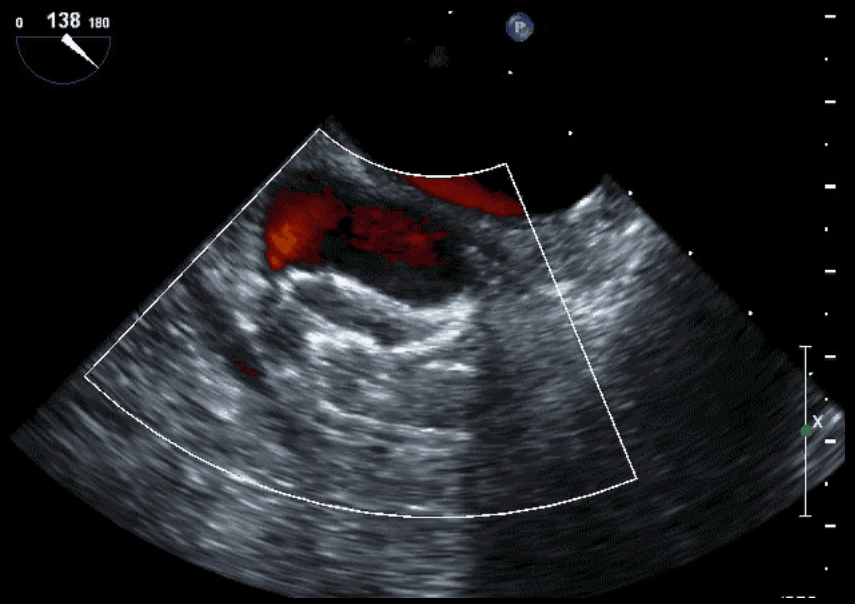
Amulet Implant Assessment



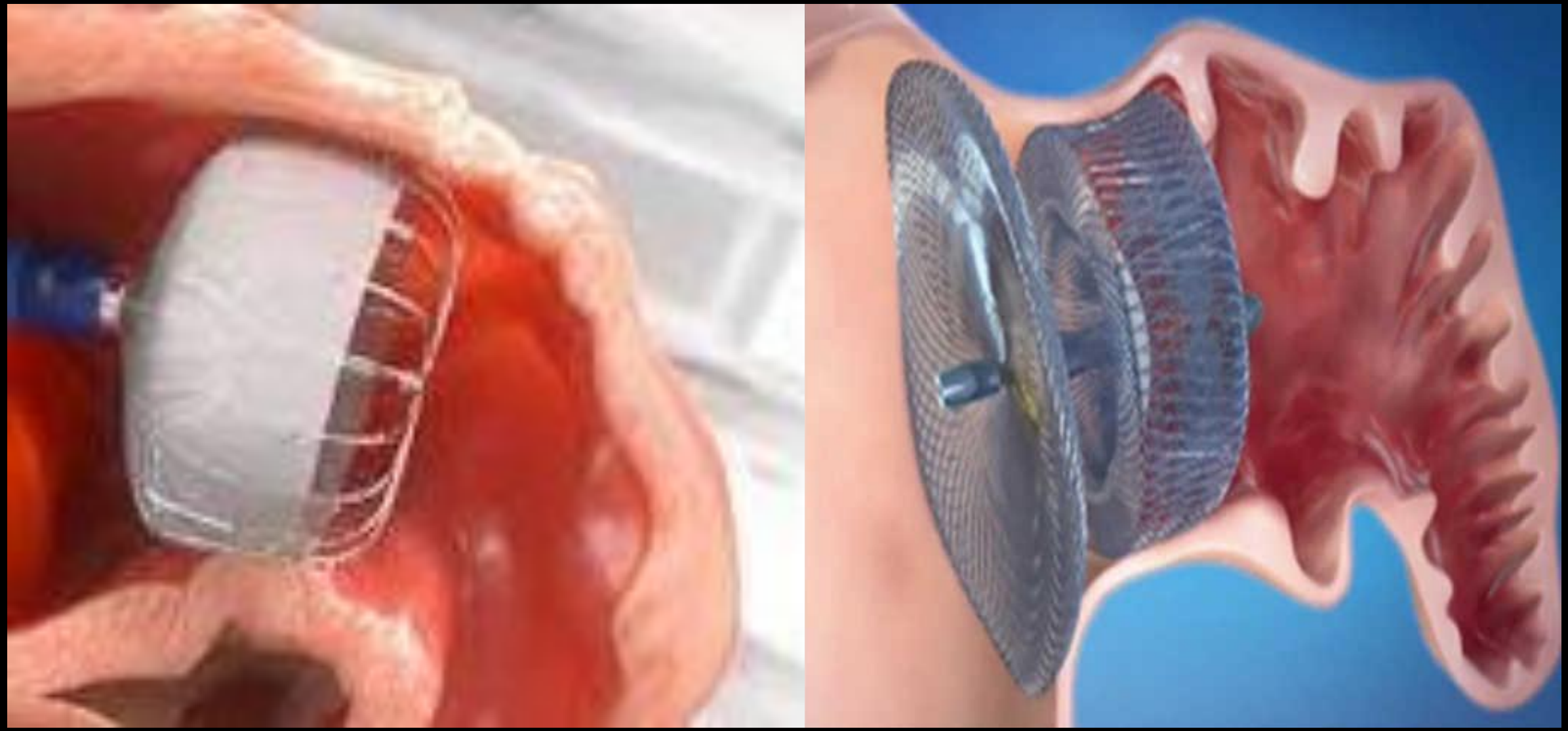




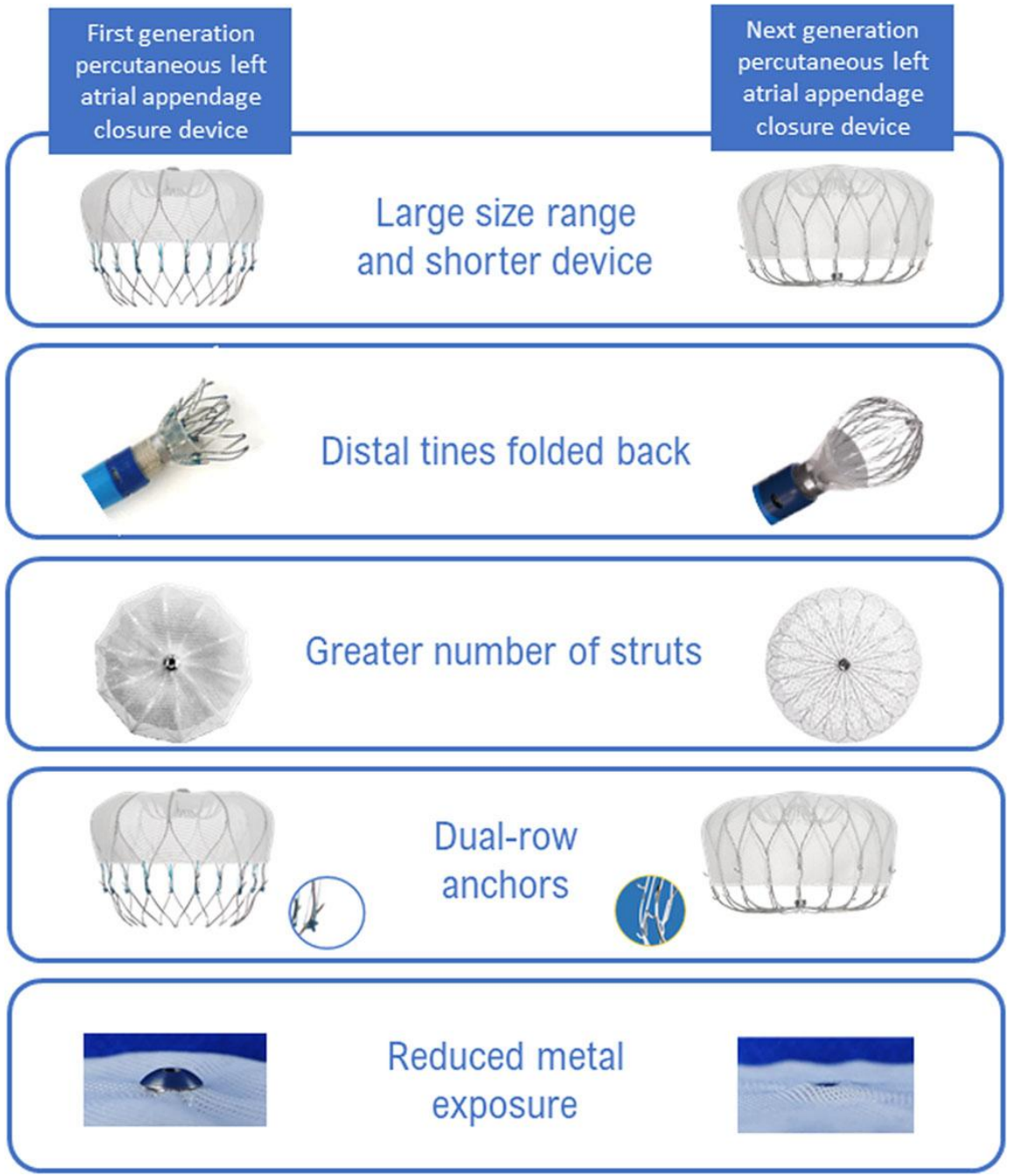




All 4 views
Nyquist 50cm/s



Watchman
Old device



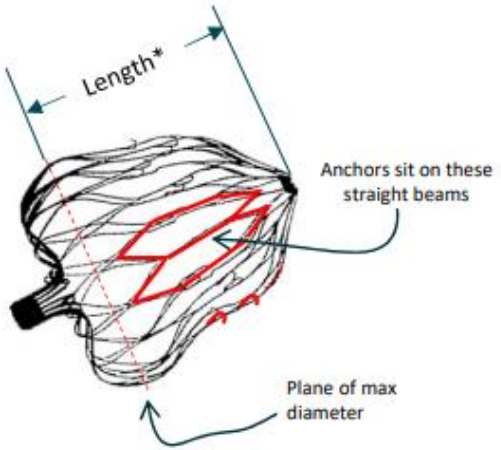
Watchman FLX
New device

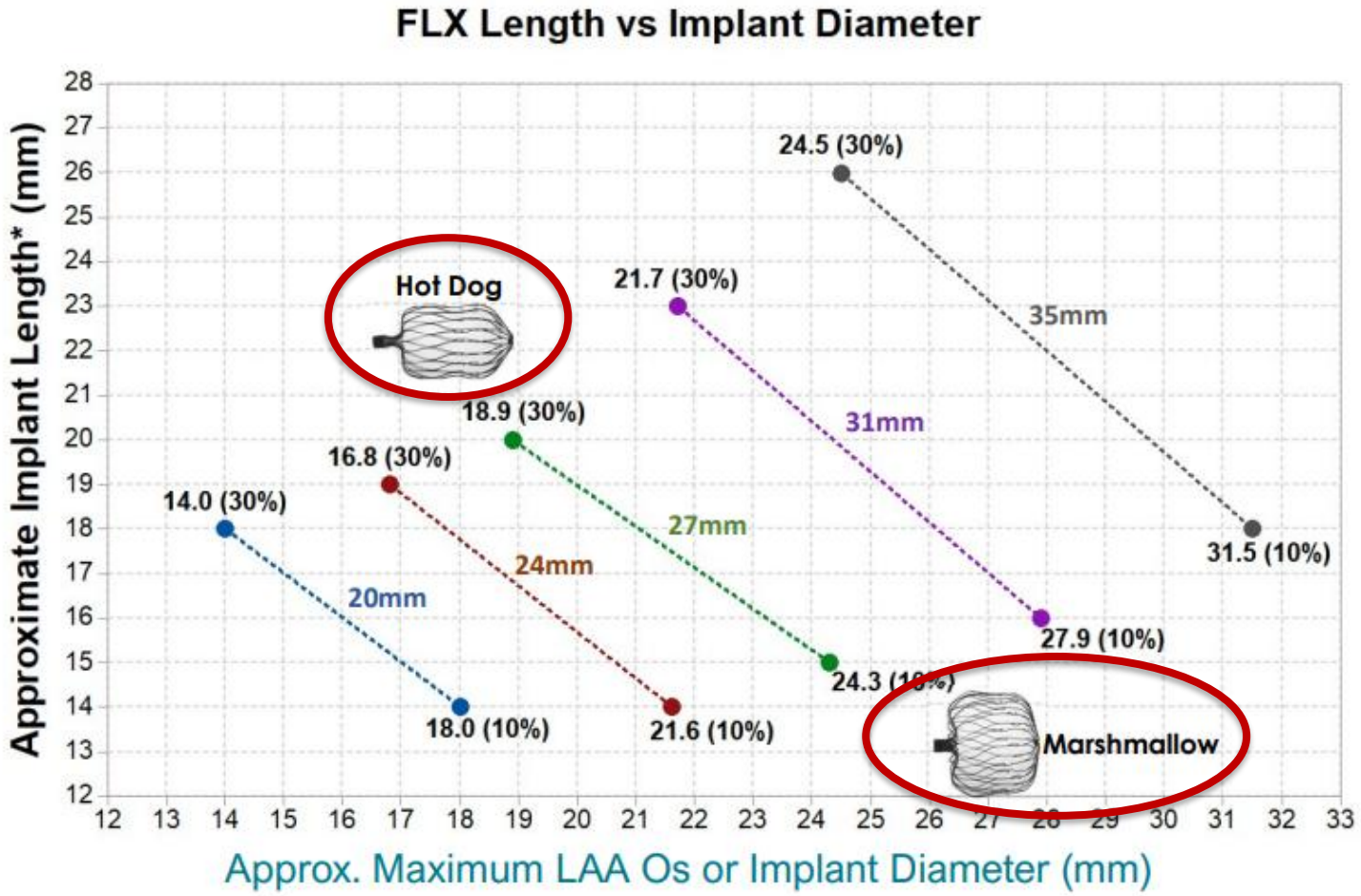
WATCHMAN FLX™ DEVICE SIZE

Device choice may be influenced by available depth.

Use a strategy to fill the LAA volume by considering length.

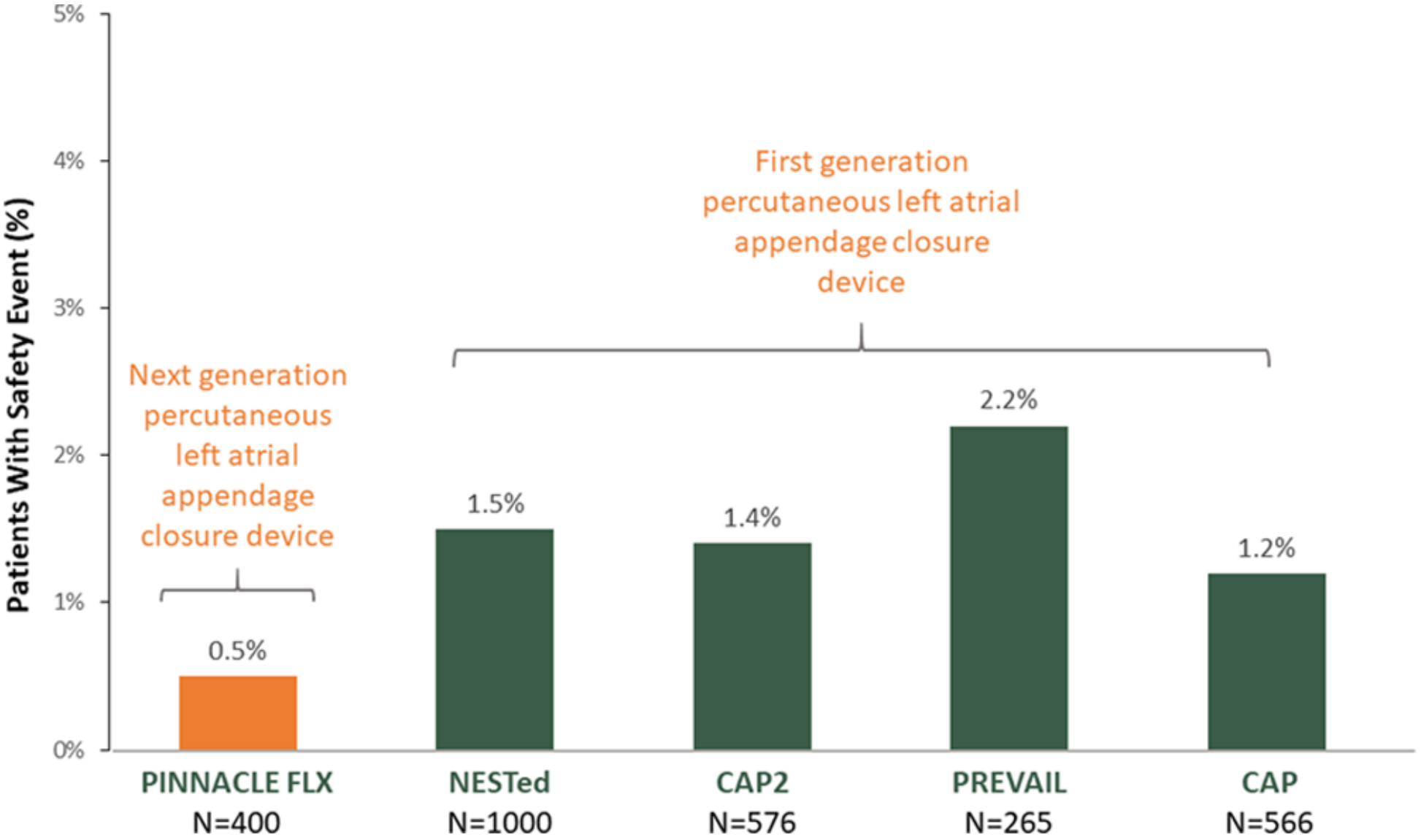
Reference Information





WATCHMANFLX LAAC DEVICE | Boston Scientific Advancing science for life™

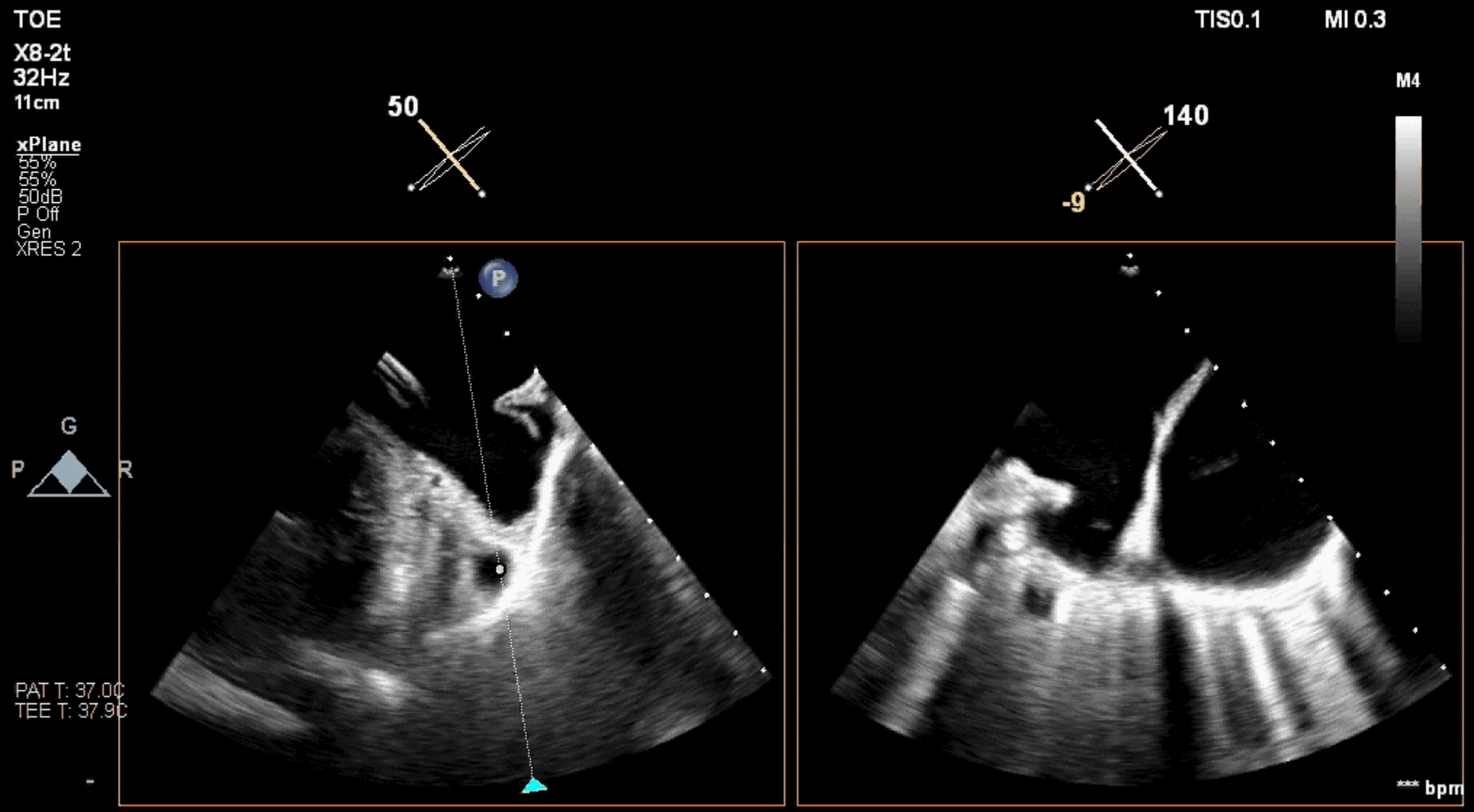
Device Safety



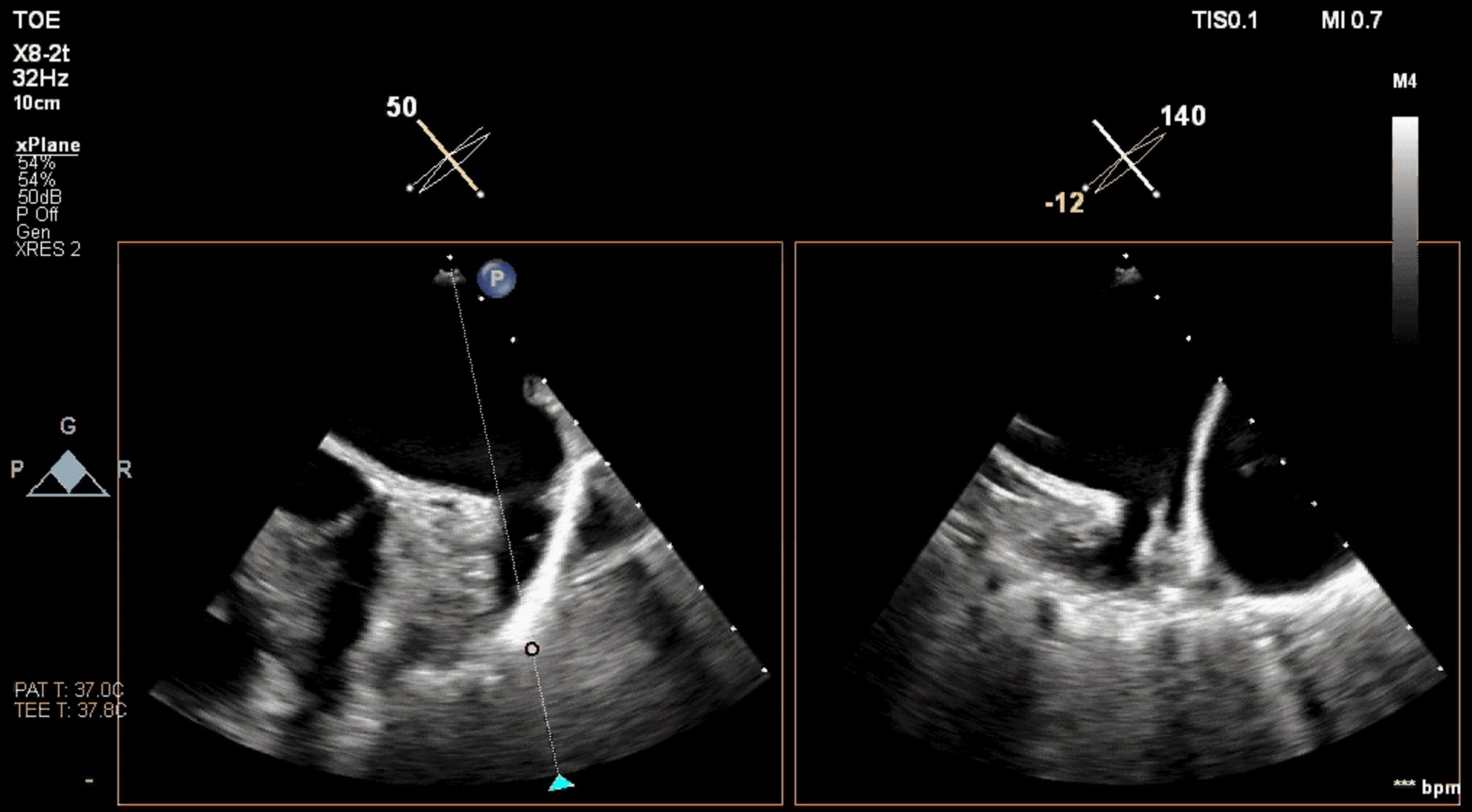
Implant Characteristics for FLX device

Parameter	N=400
Implant success	98.8% (395/400)
Unsuitable anatomy	3/400
Device did not meet release criteria	2/400
Procedure time, min	37.9±21.9 (400) [11.0, 174.0]
Number WATCHMAN FLX devices used per case	1.2±0.4 (400) [1.0, 4.0]
Final device size, mm	
20	11.4% (45/395)
24	26.8% (106/395)
27	31.1% (123/395)
31	22.8% (90/395)
35	7.8% (31/395)

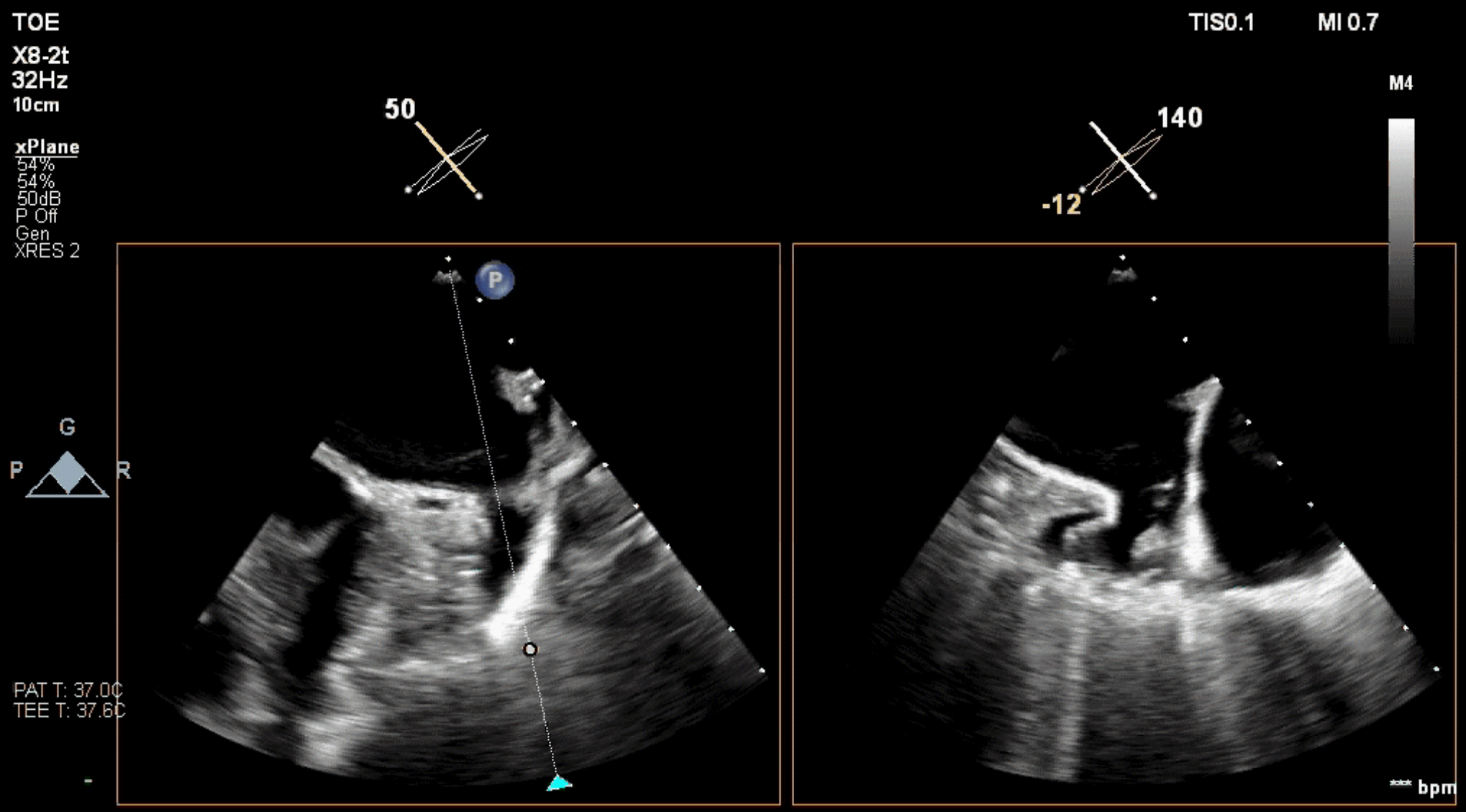
Watchman FLX Device Implant



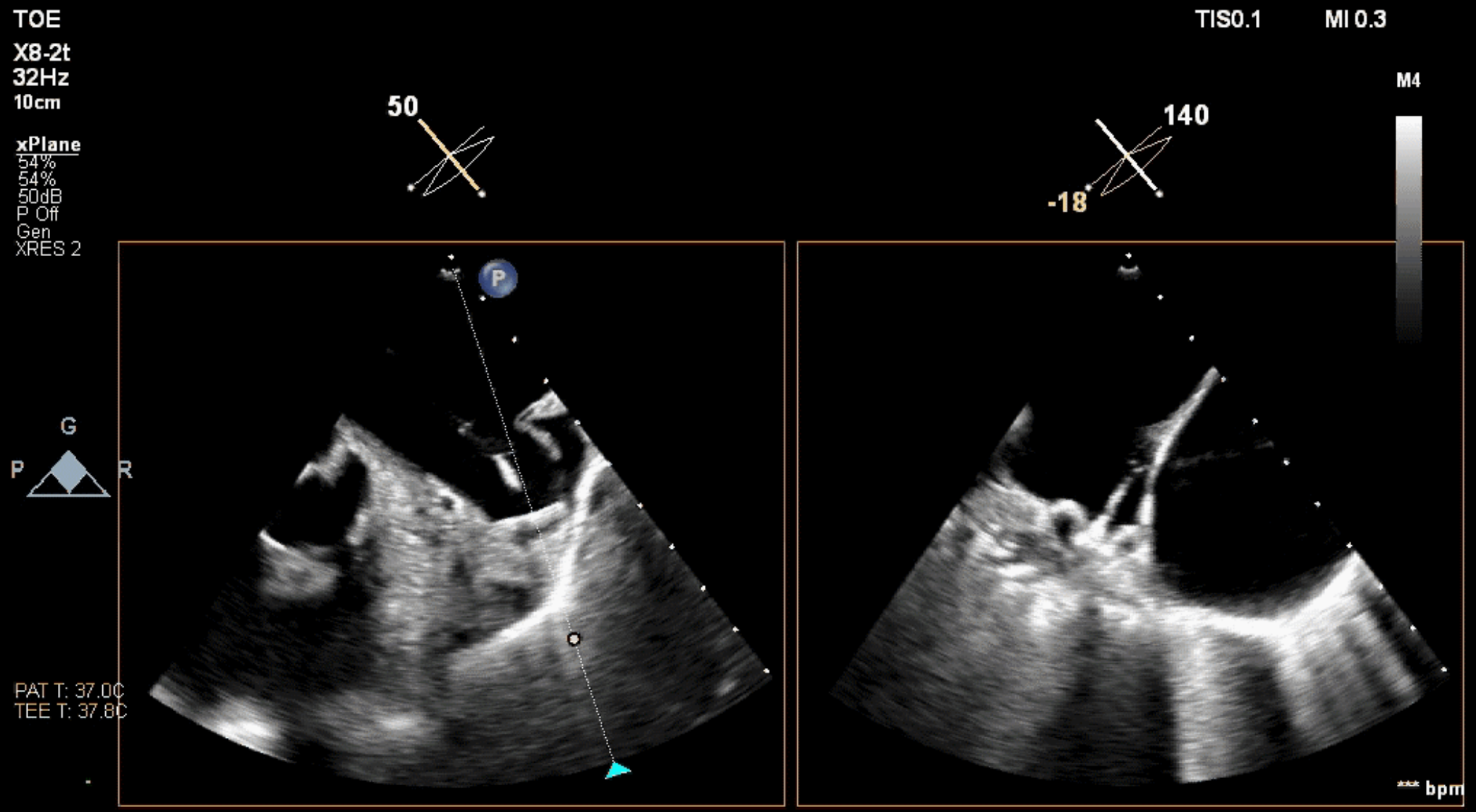
Watchman FLX Device Implant



Watchman FLX Device Implant



Watchman FLX Device Implant



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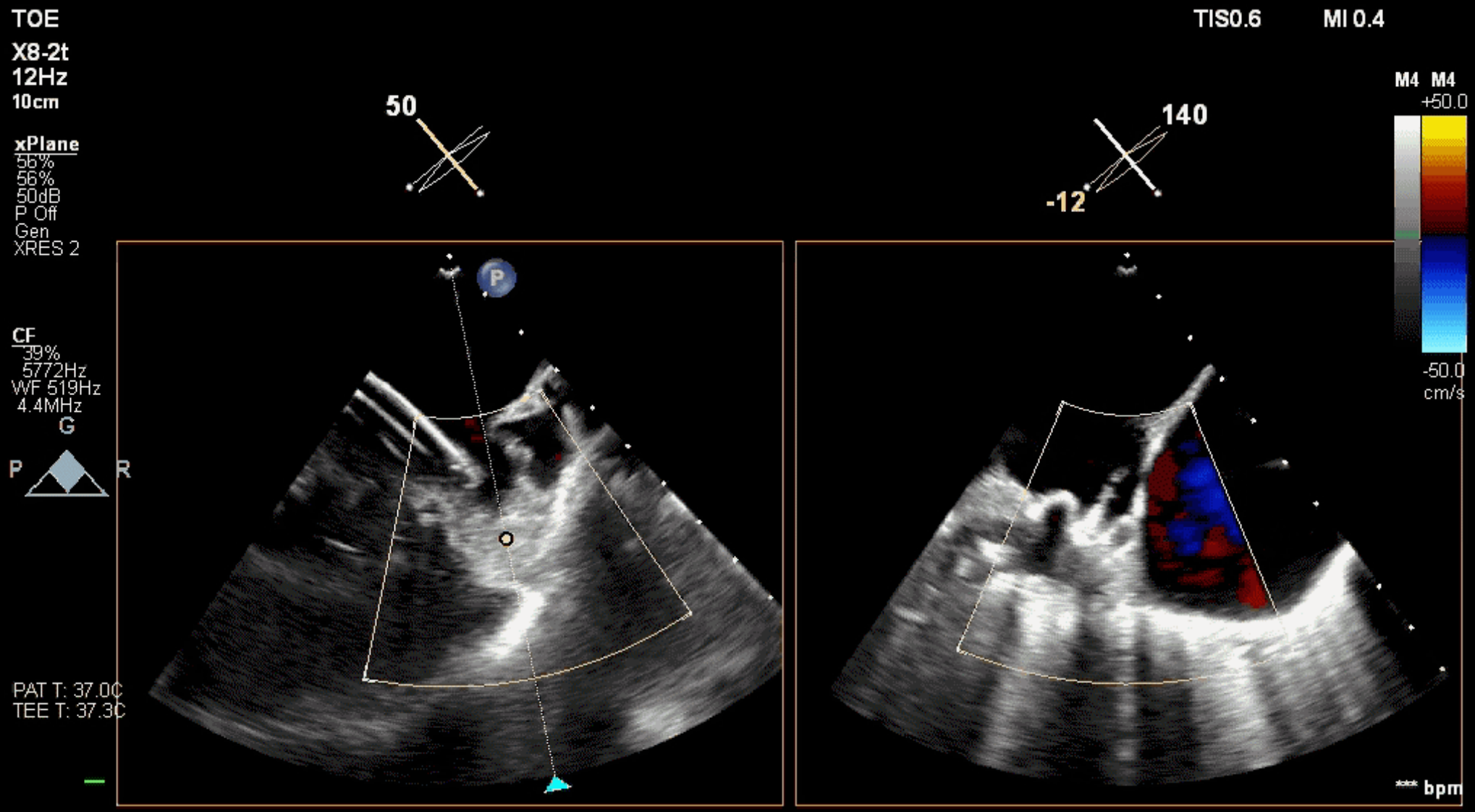
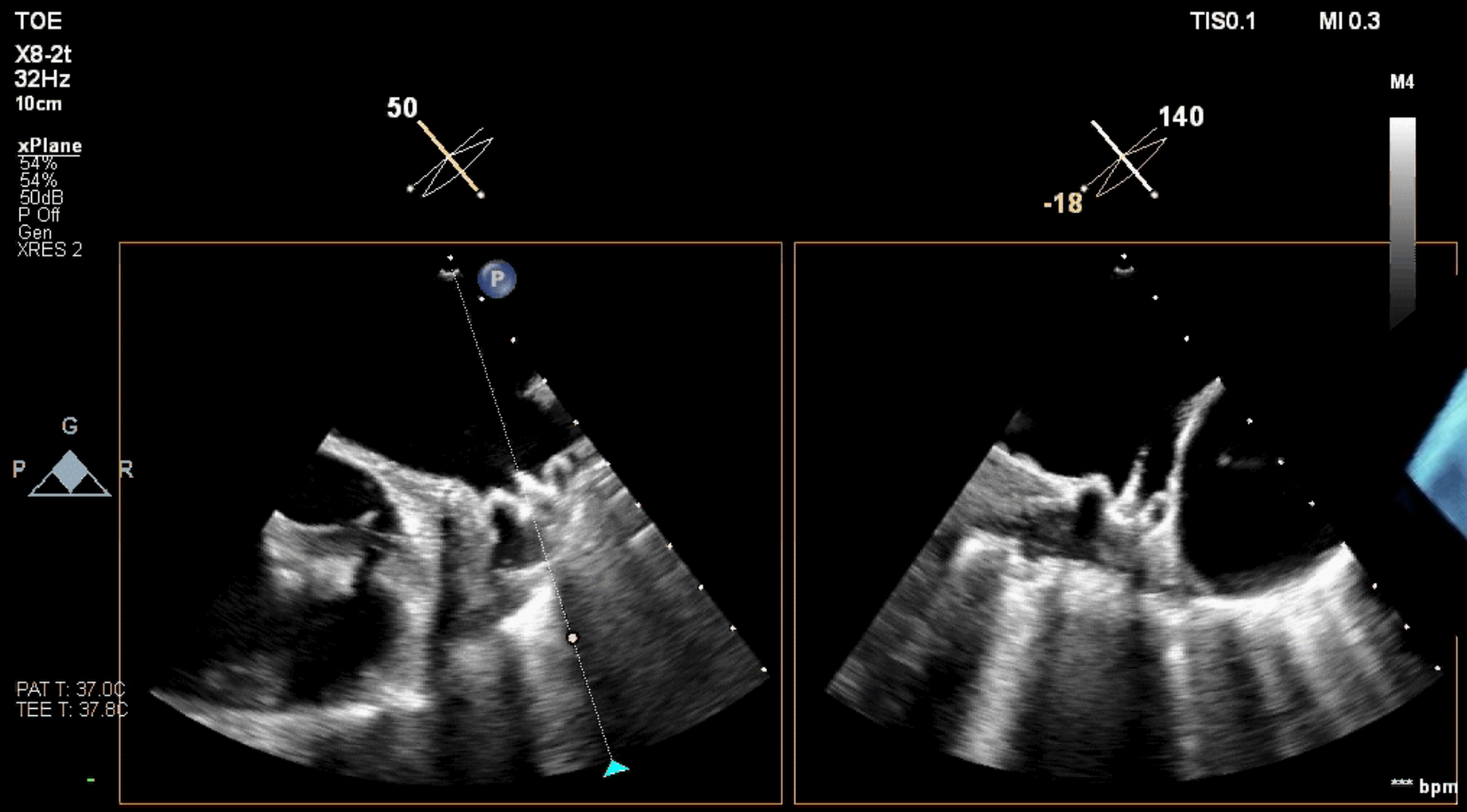
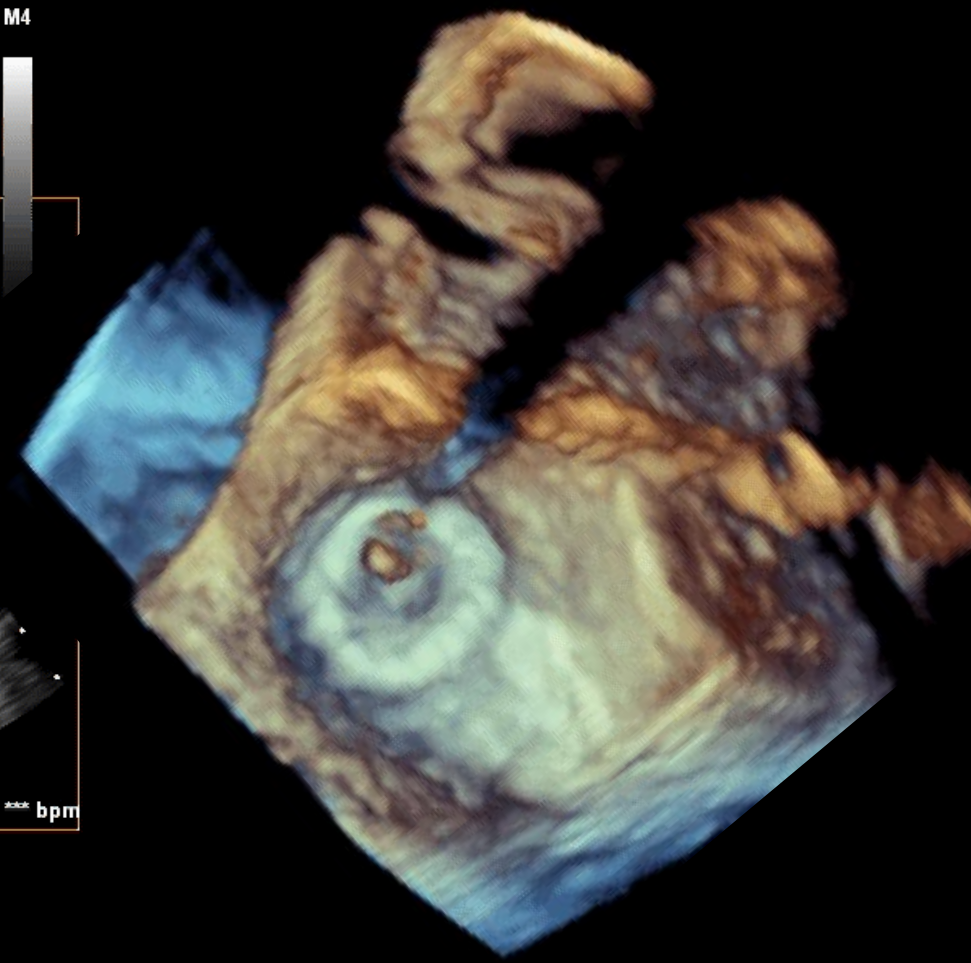


Watchman FLX Device Implant





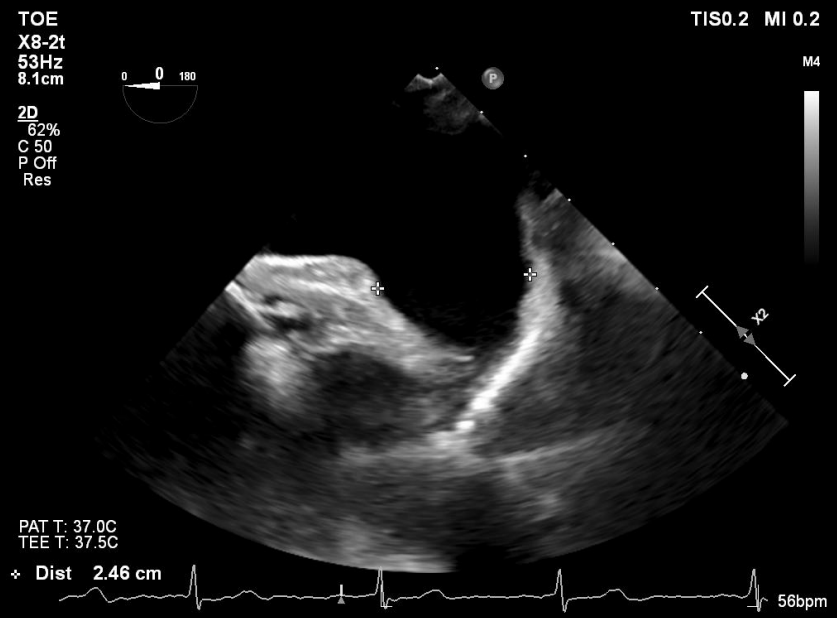
Case

Case

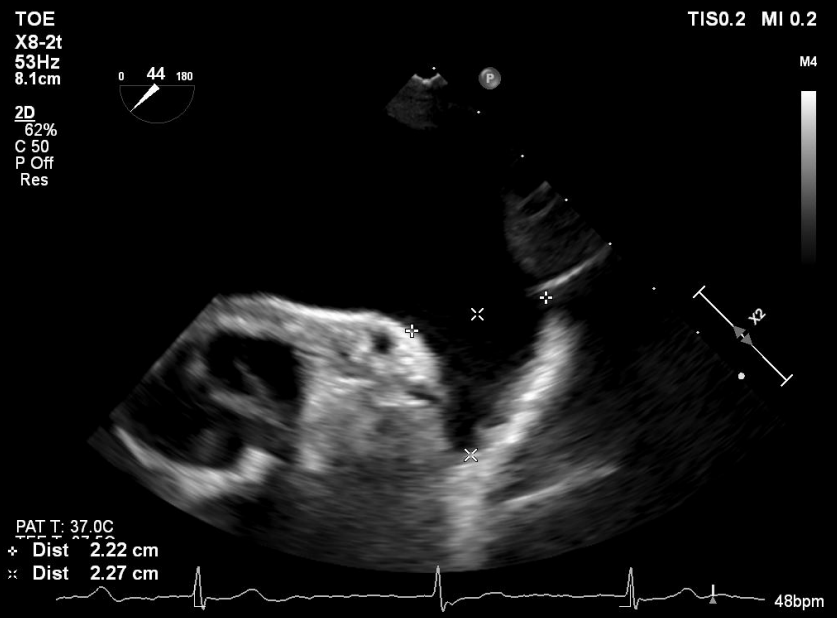
- 75 yo lady
- On apixaban for AF
- Tripped and fell
- Hit head
- Subdural haematoma requiring evacuation

Case

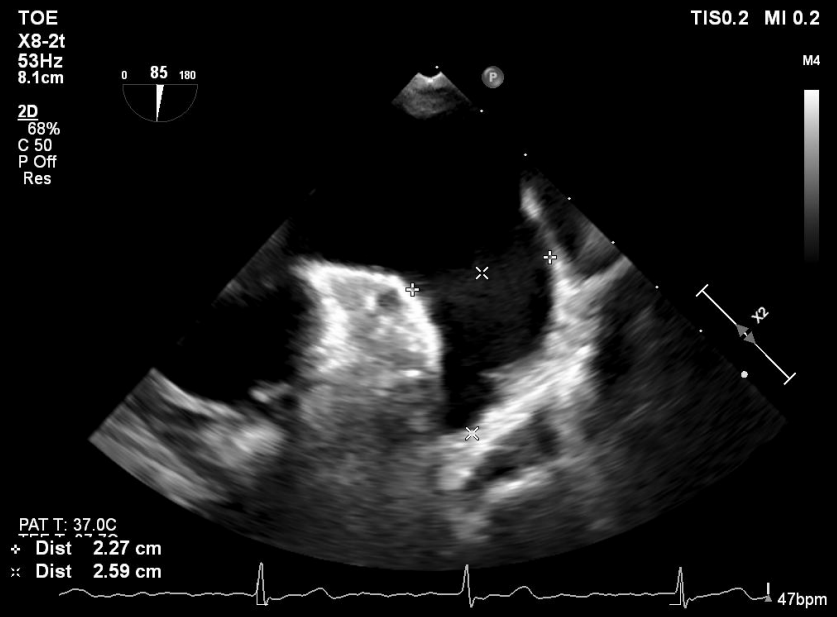
0 deg
25mm



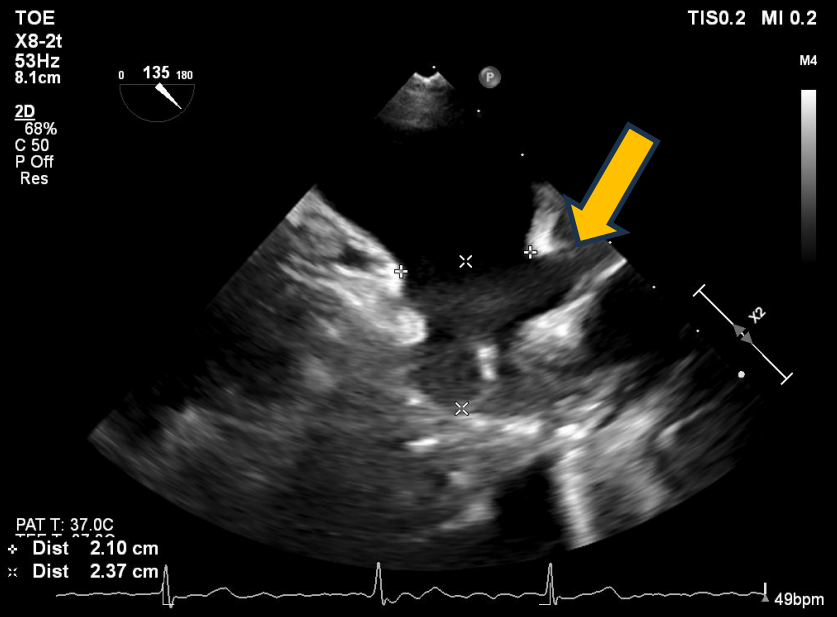
45 deg
22mm



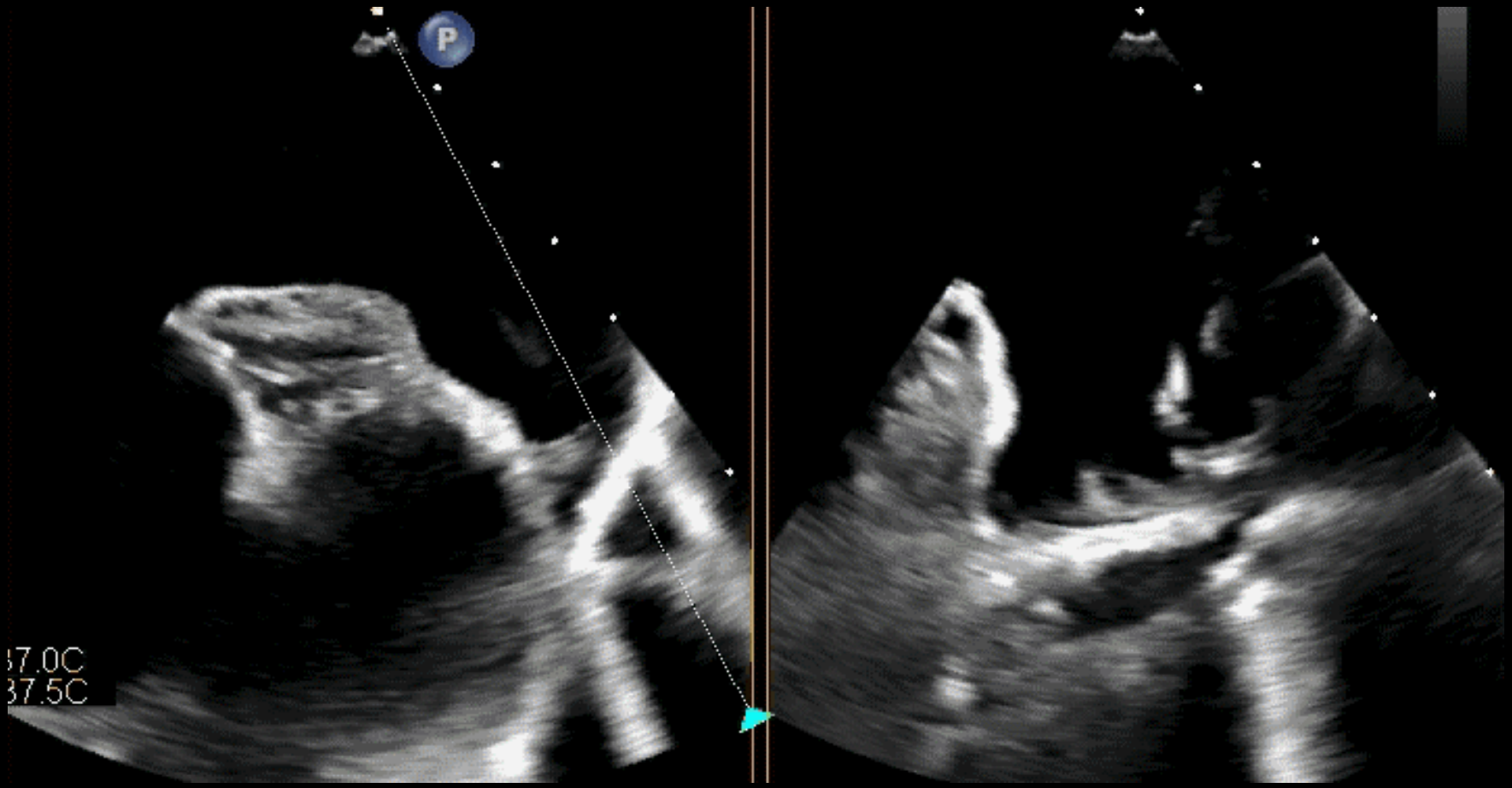
90 deg
23mm



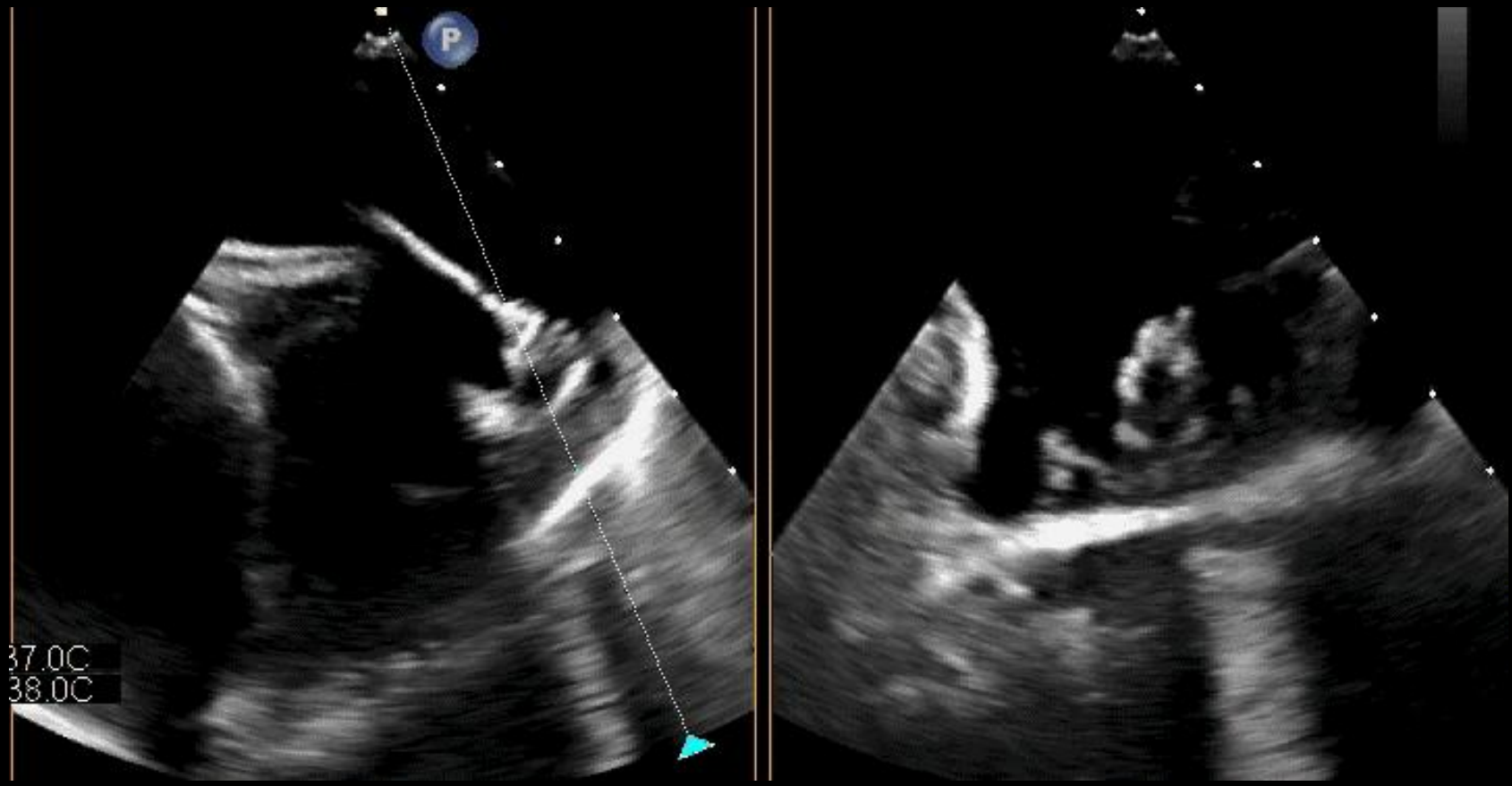
135 deg
21mm



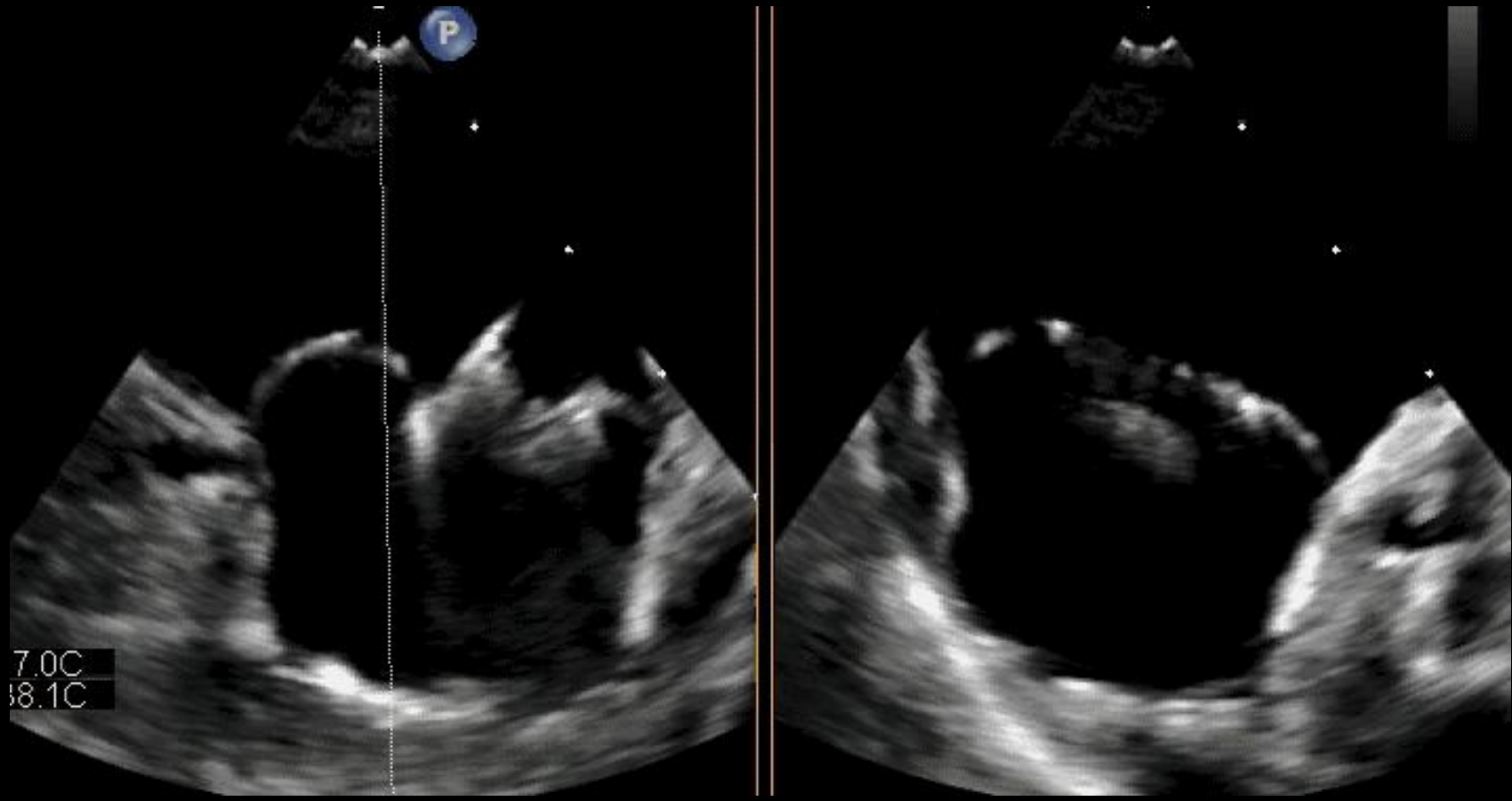
Case



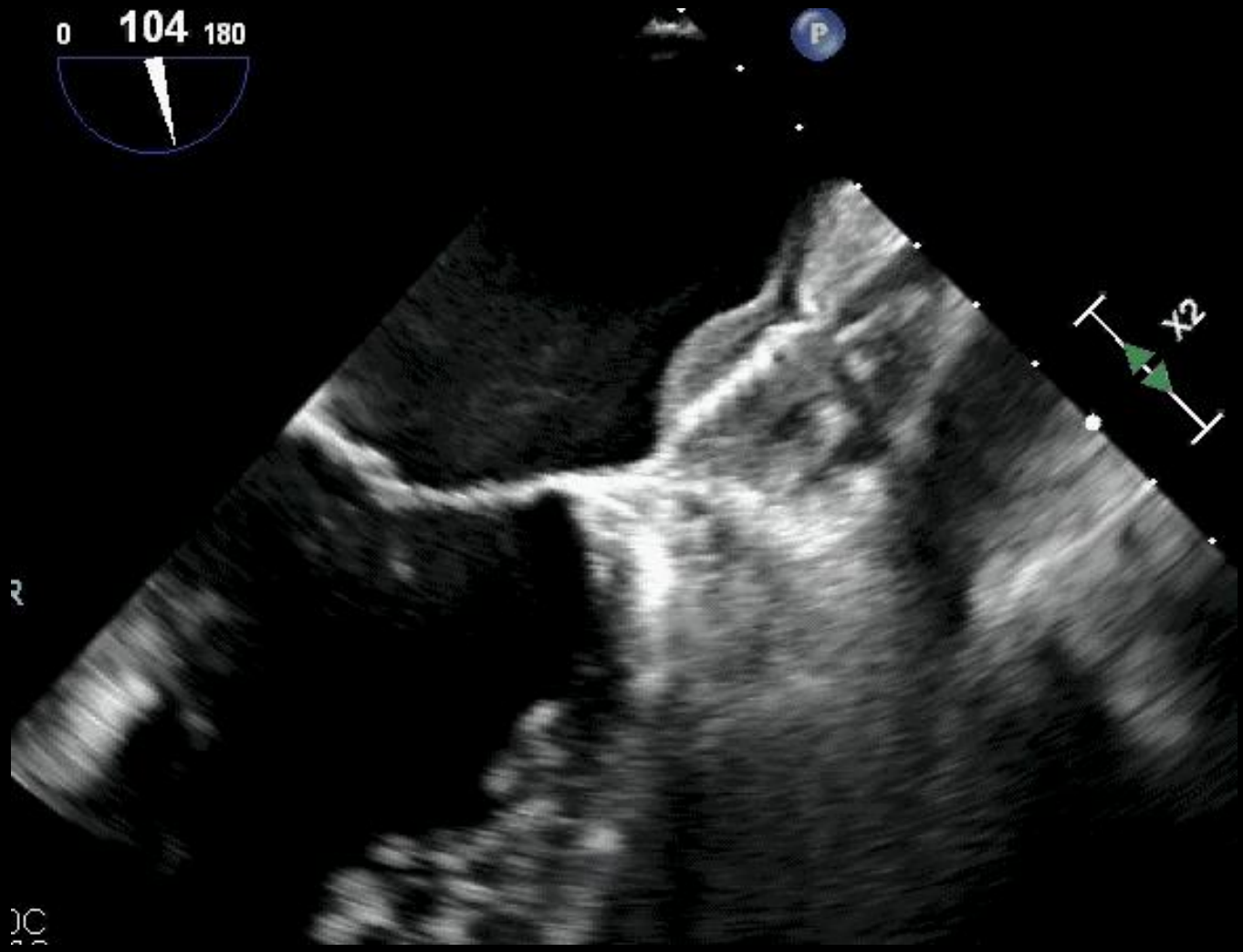
Case – The Ball



Case – Device Deployment

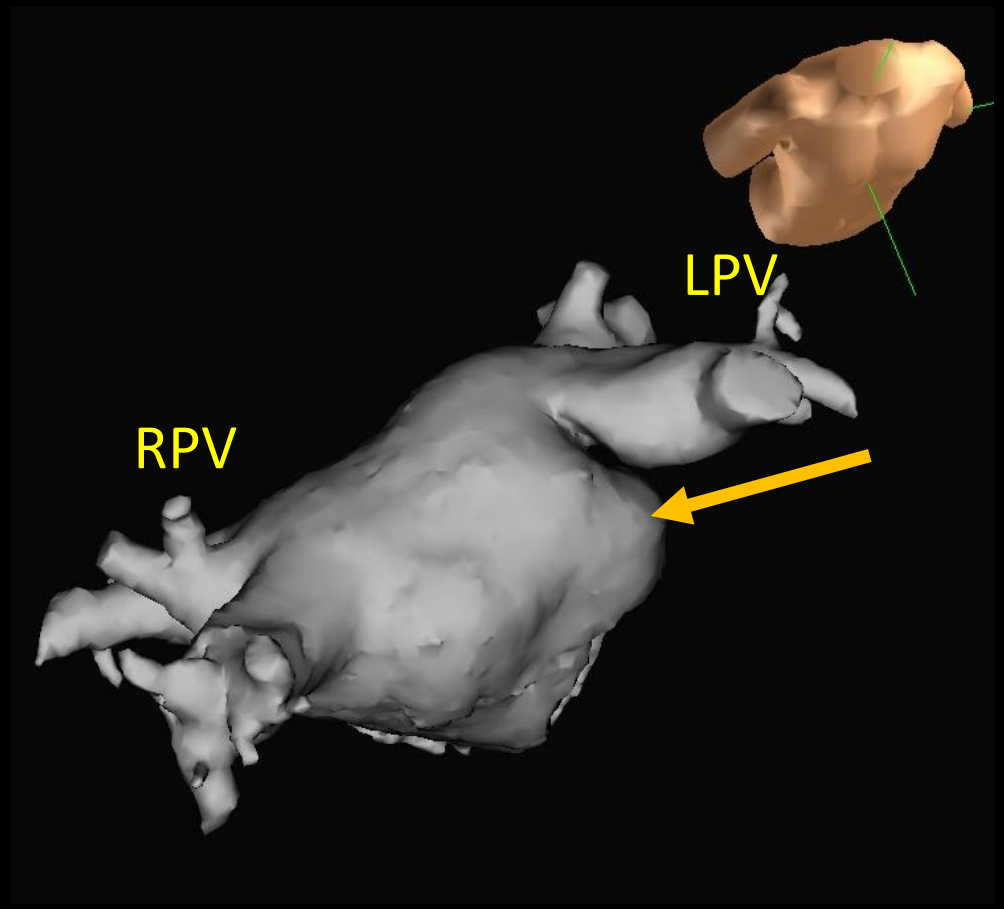


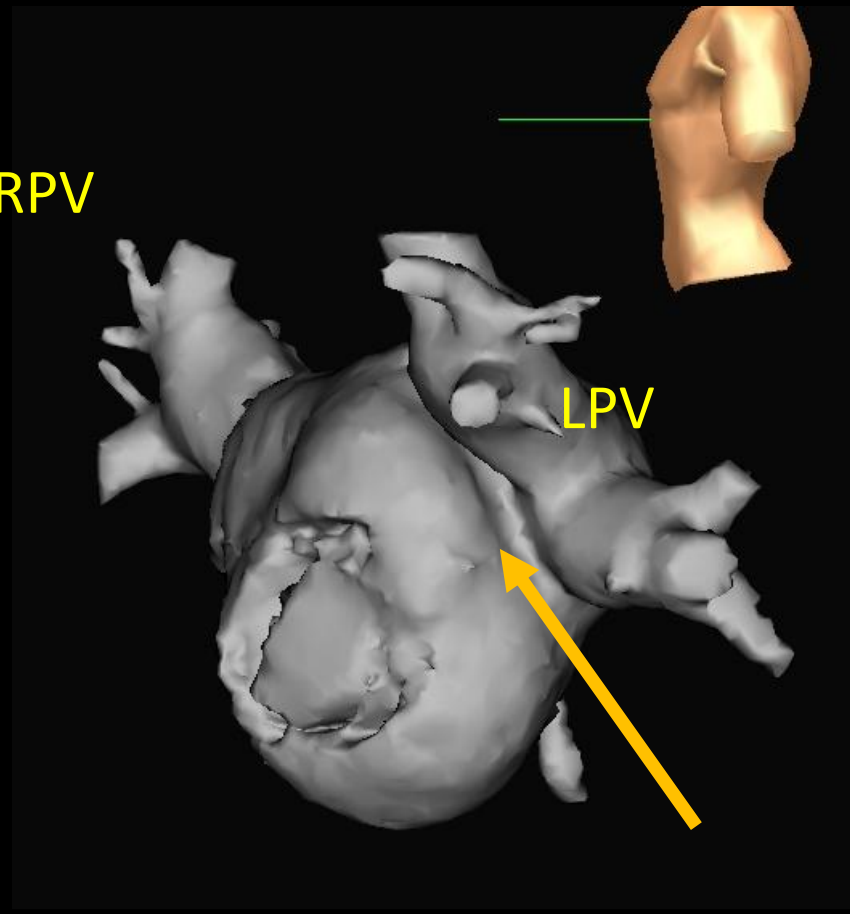
Case – Follow Up TOE



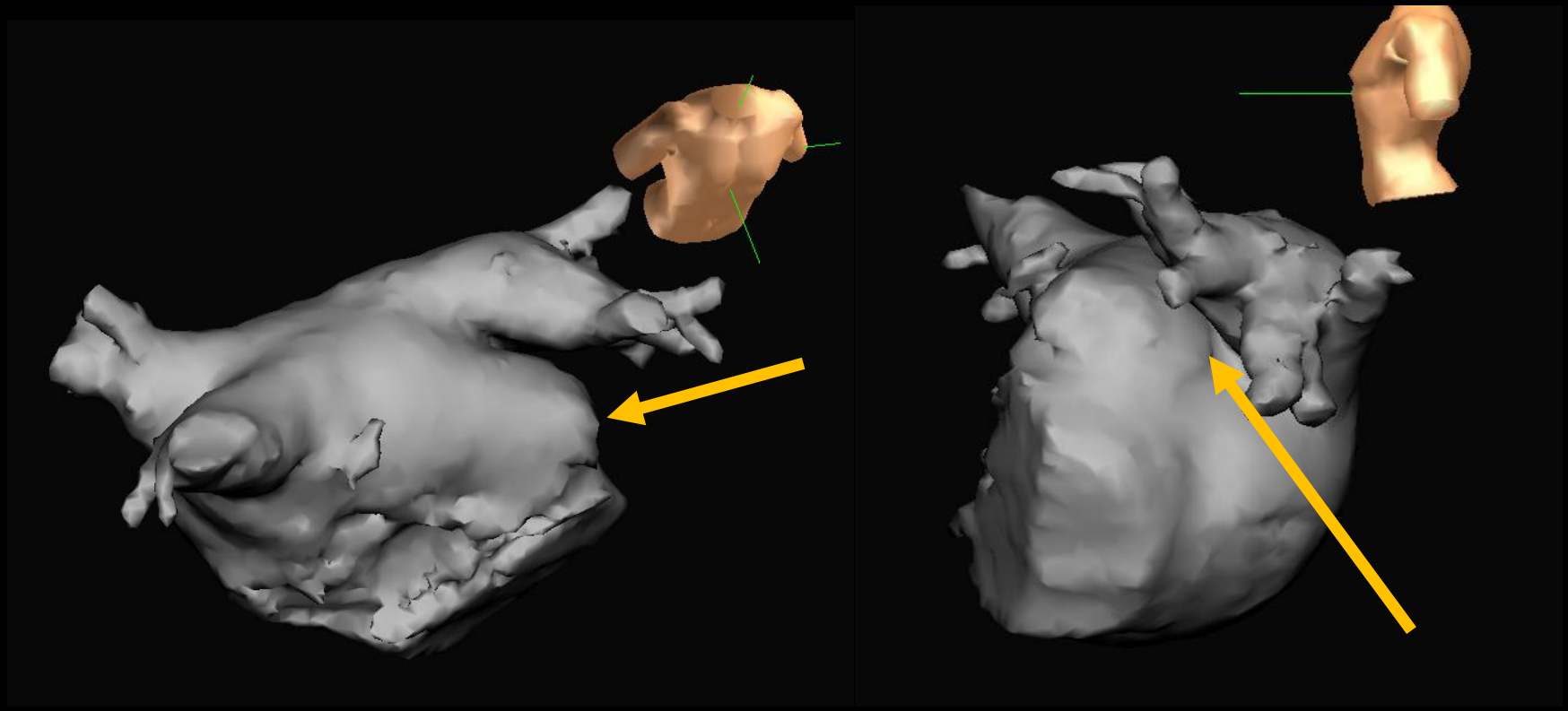
Case

LAA surgical excision

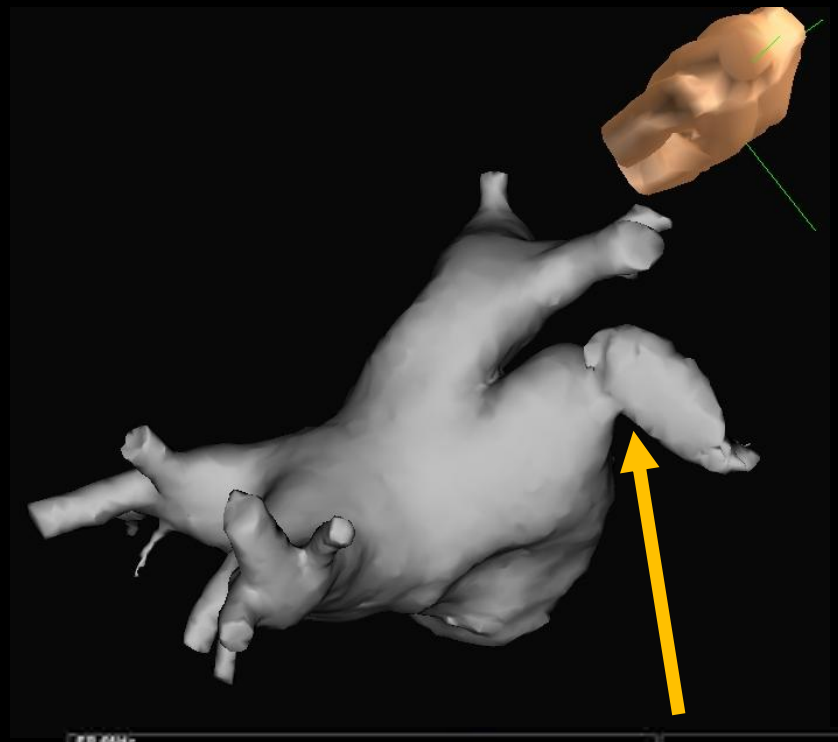


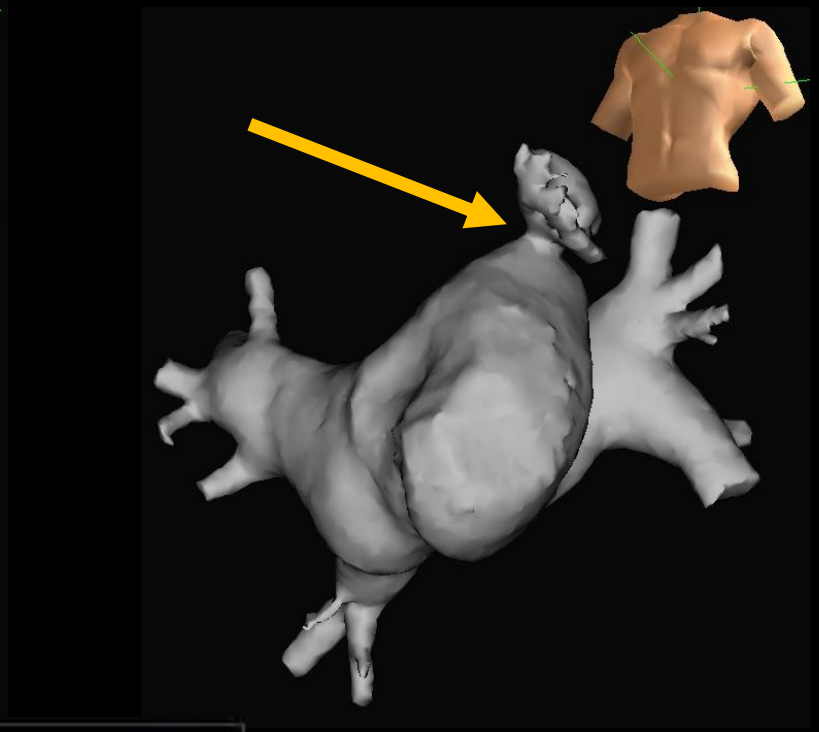


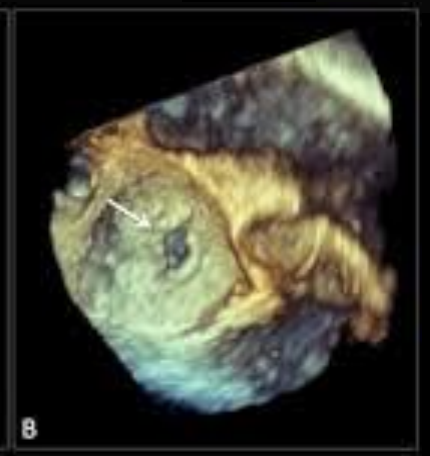
LAA surgical excision



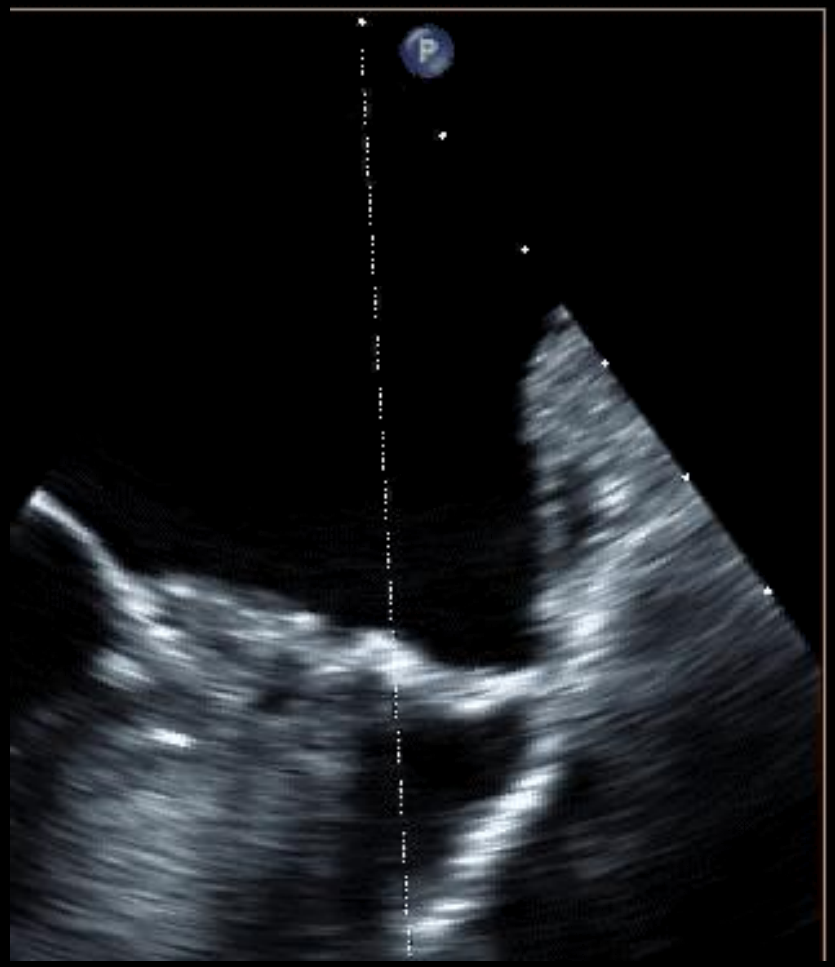
Incomplete Surgical LAA Closure

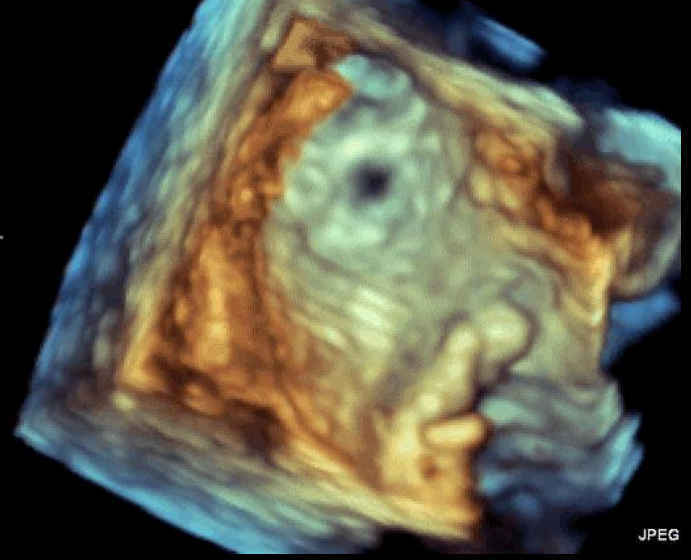




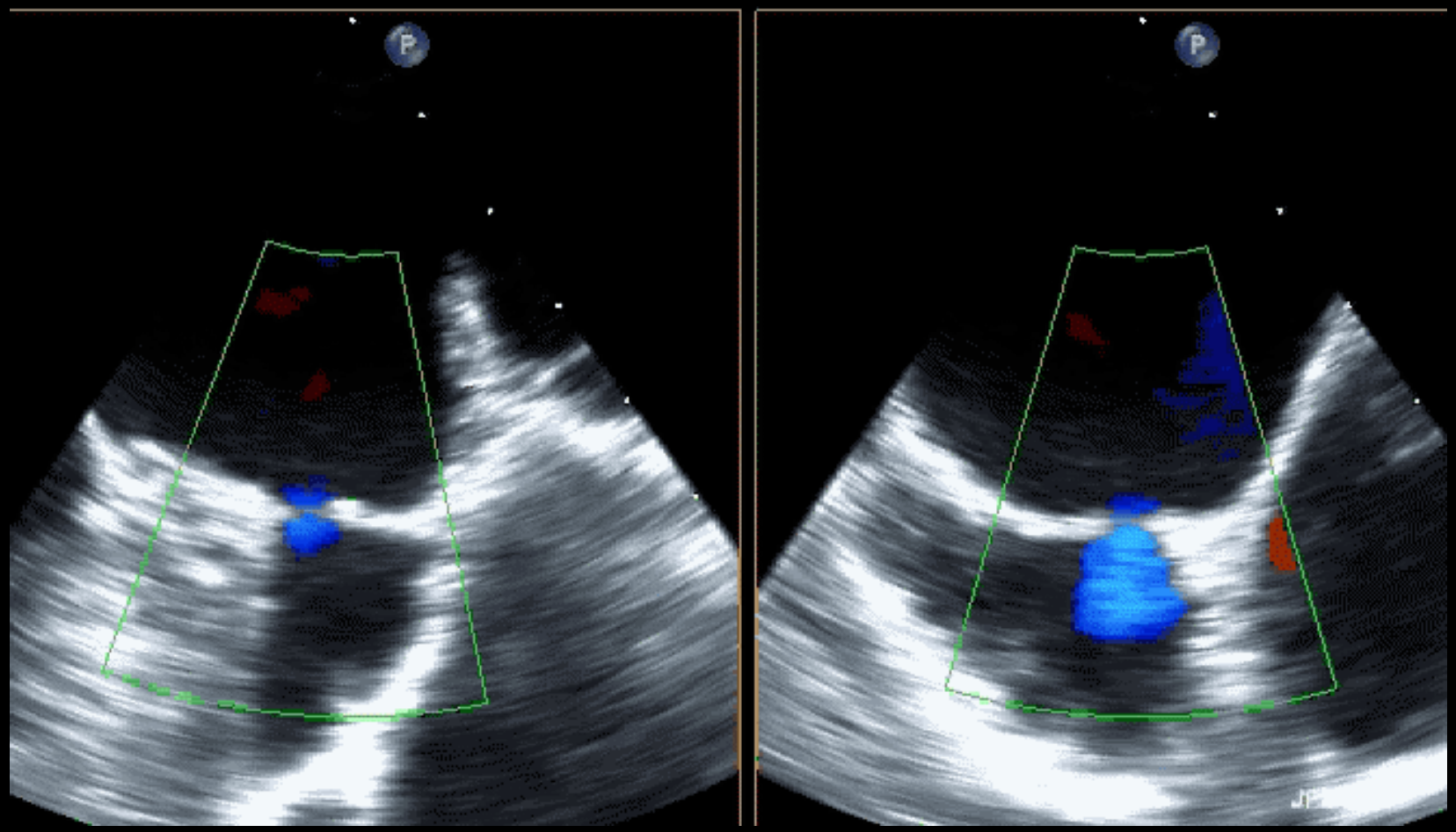


Residual defect

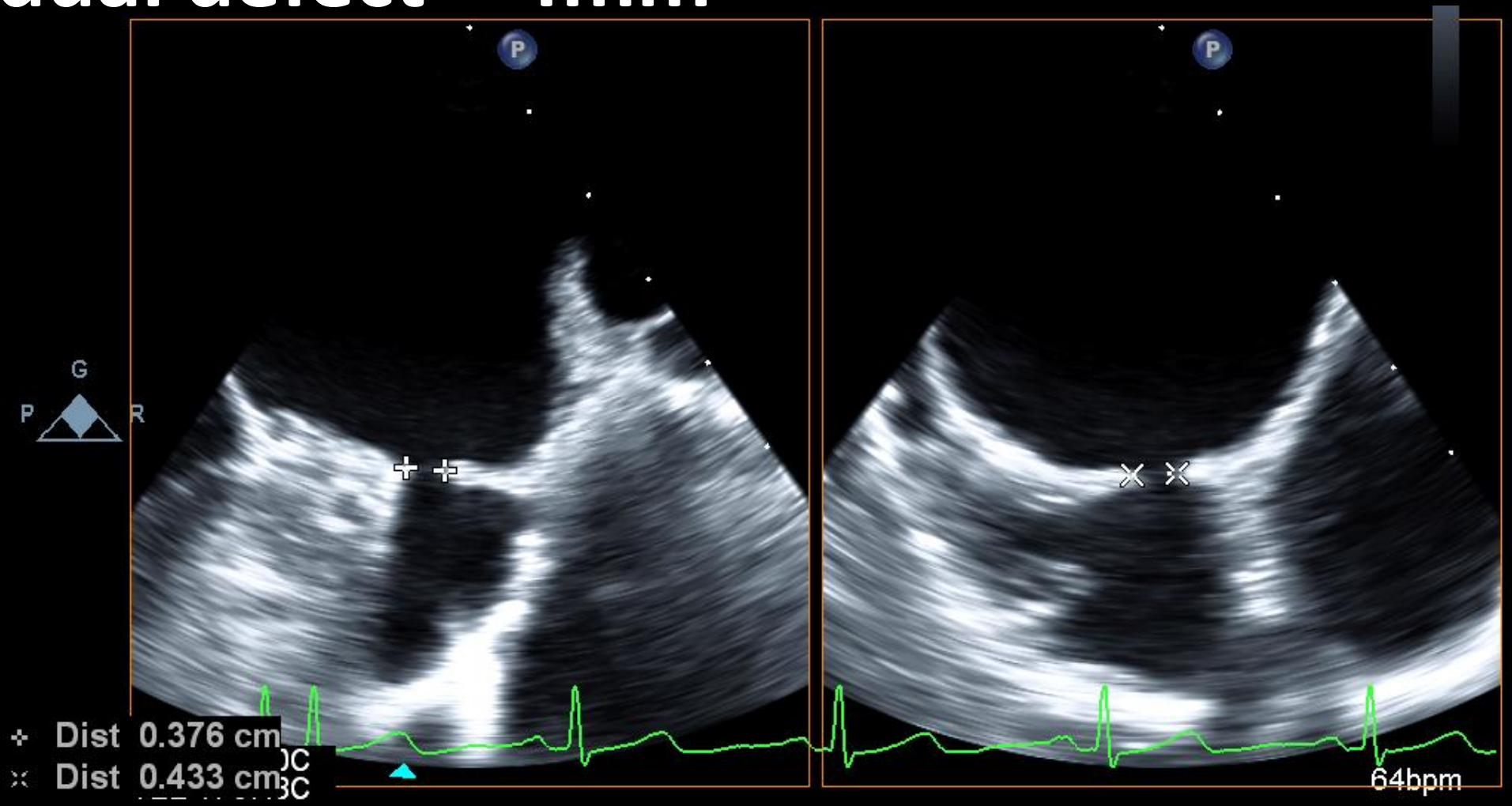




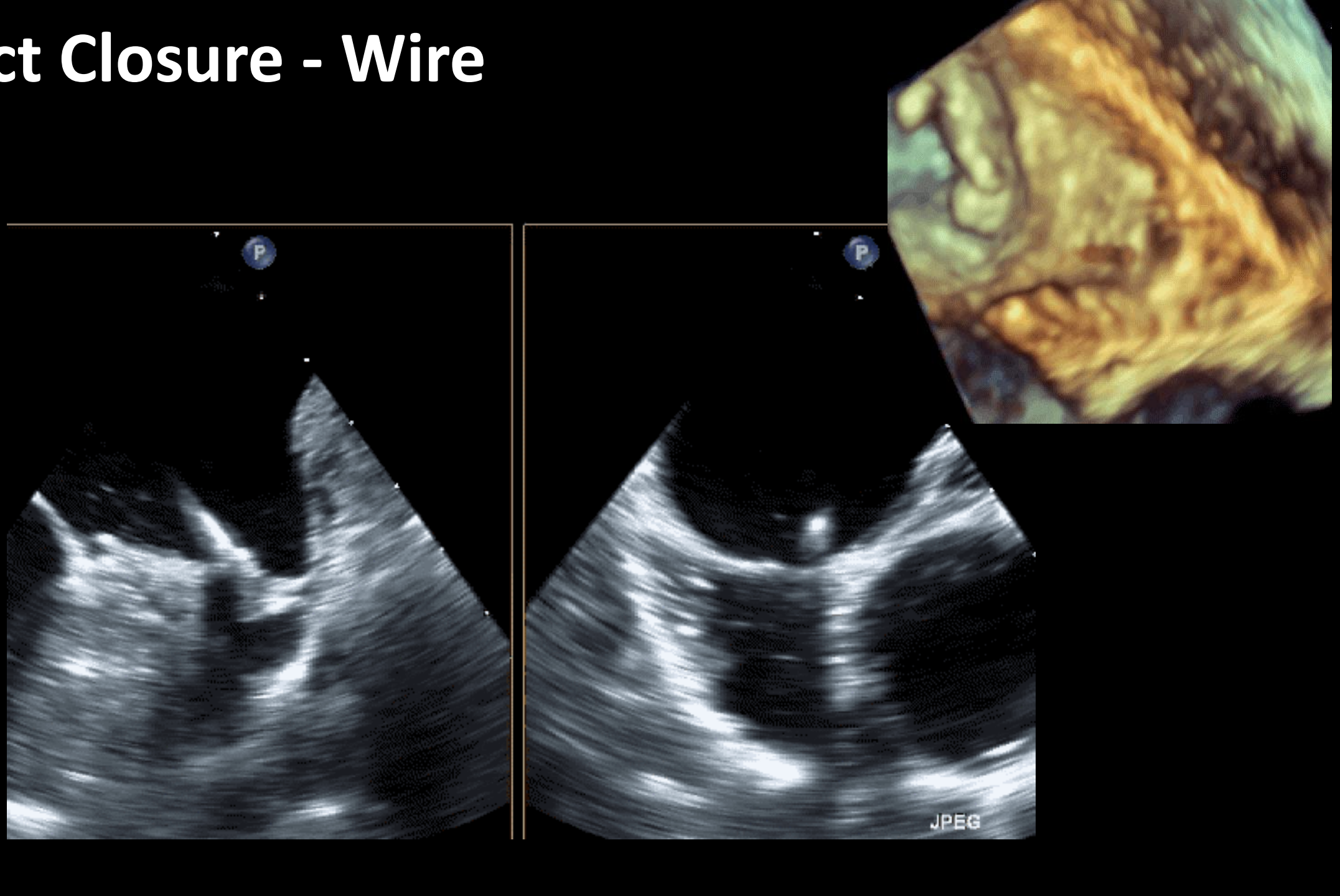
Residual defect – To and Fro Colour Flow



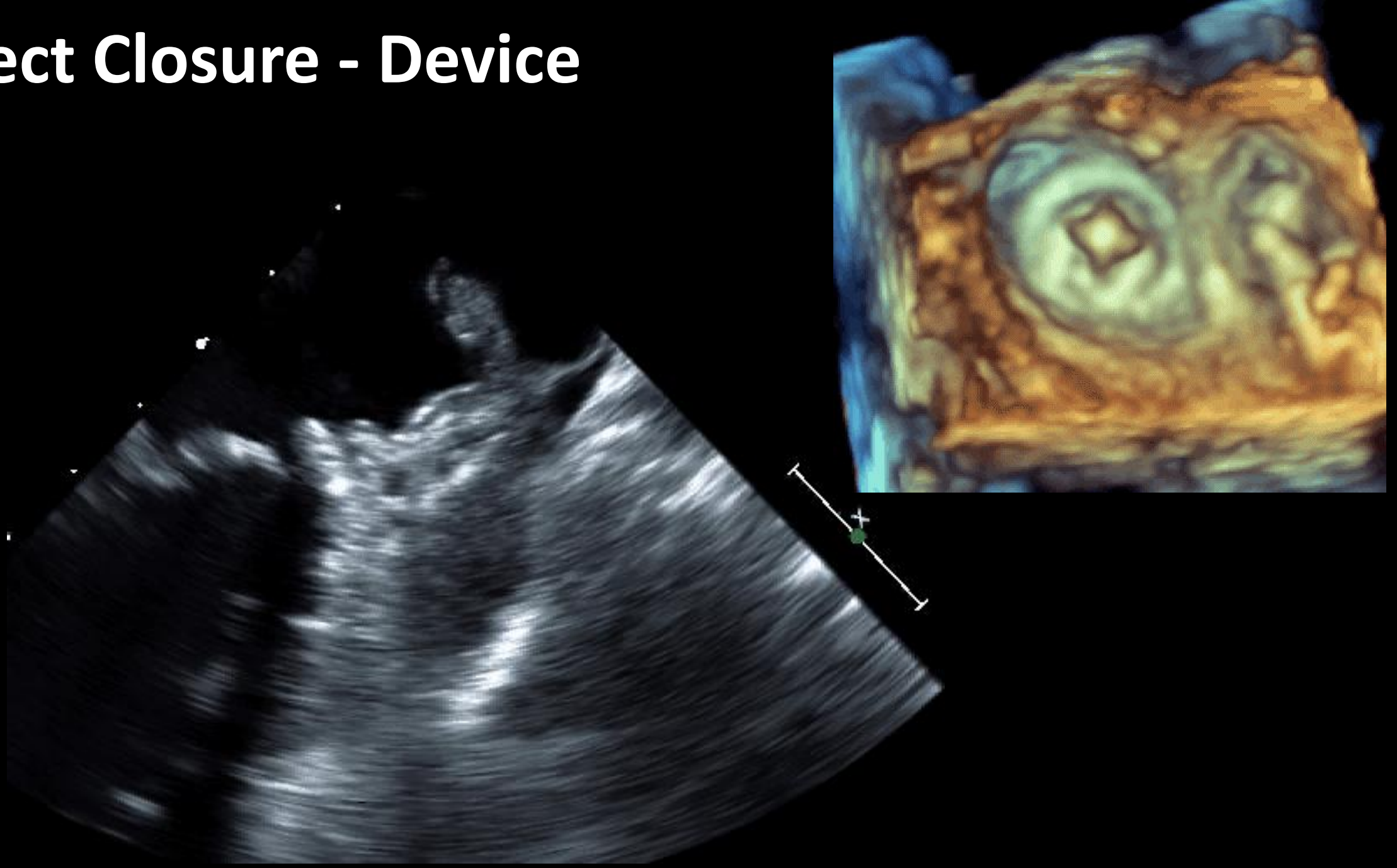
Residual defect – 4mm



Defect Closure - Wire

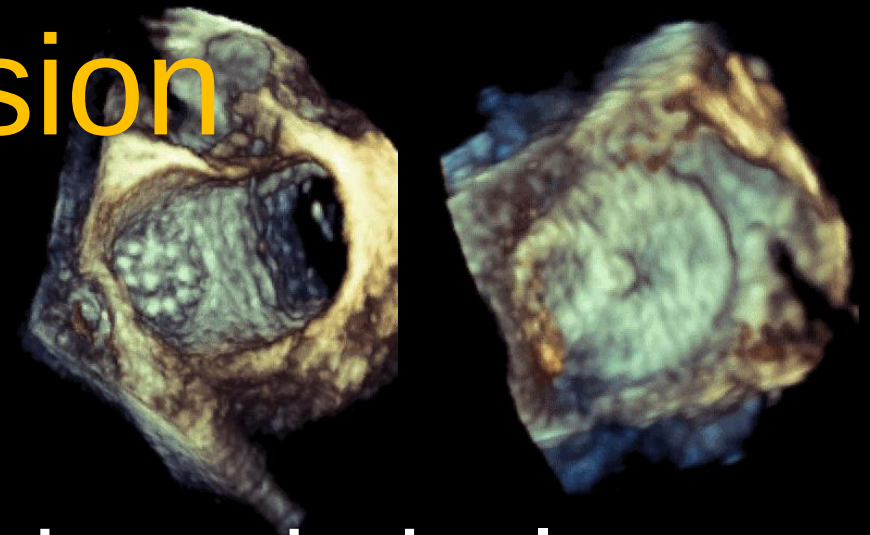


Defect Closure - Device



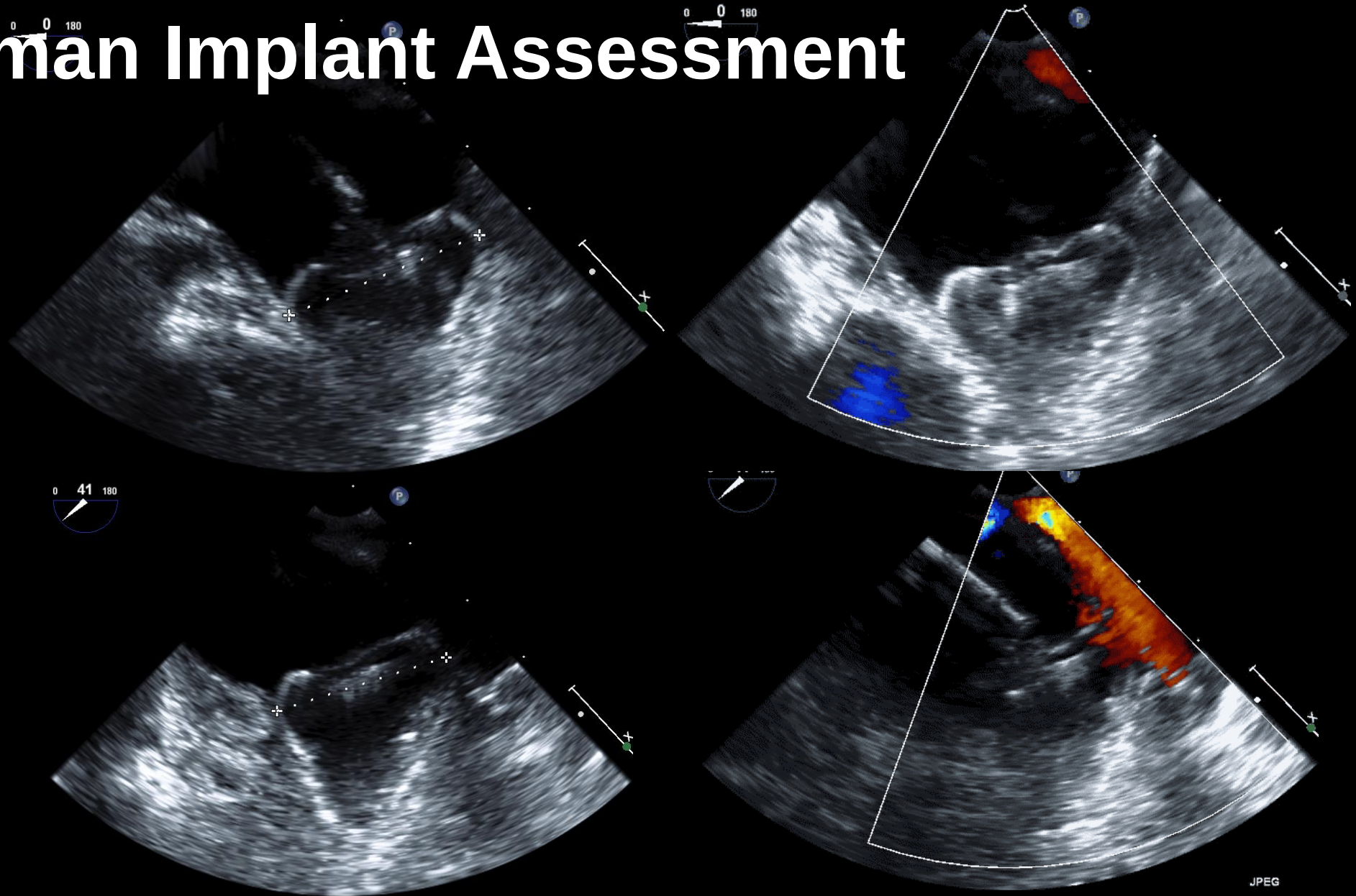
Percutaneous LAA Occlusion

Tips, Tricks & Take Homes



- No two LAA's are the same
- Identify features that may provide technical challenges from the start
- 3D perspective important
- Regardless of device, TS puncture is key to success
- Landing zone same for all devices
- Residual defects can be closed

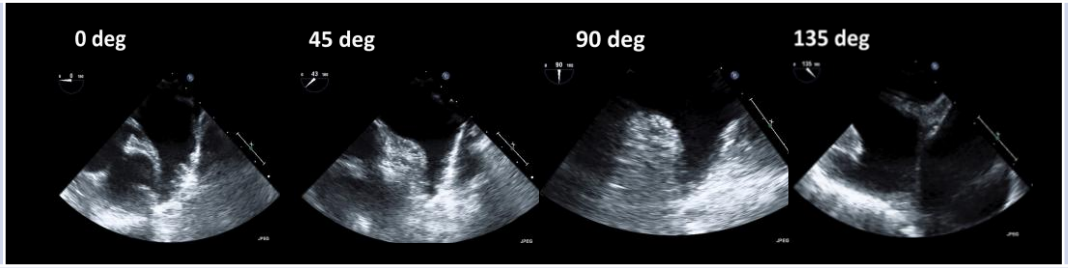
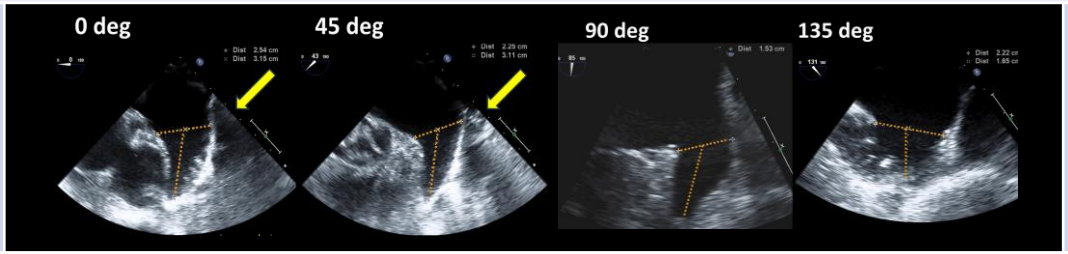
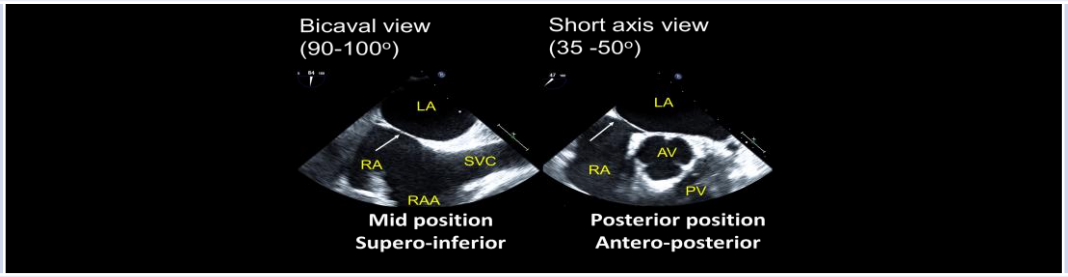
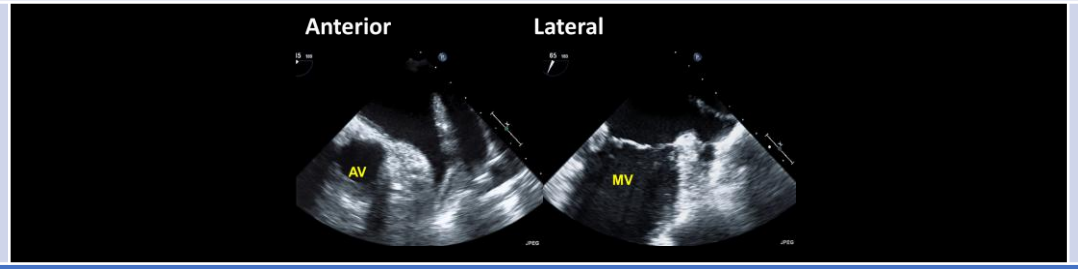
Watchman Implant Assessment



"Crown" with screw thread on view

Assess for peridevice leak Nyquist @ 50cm/s

LAAO ProTOE Assessment Quick Reference Guide

Key images	Images	Tips
LAAO views		
O, 45, 90, 135		Find the longest axis first to measure LAA ejection velocity, then move to each angle to evaluate for number of lobes and accessory lobes. If any view is too difficult, choose the perpendicular view and biplane to evaluate desired angle.
LAAO sizing		
		Measure the **landing zone** (LCx to 1-2cm from the limbus in smooth zone) at **same depth** (use side depth markers to confirm). Expect the measurement line in first 3 views to angulate 10-20° from LCx. The 135° measure will look flat (AP view). Measure the depth from the landing zone to apex.
Interatrial septum		
		Assess the interatrial septum for fossa size and degree of thickening of the surrounding septum. Trans-septal puncture position will depend on LAA orientation (below). Assess for presence/absence of PFO.
LAA Orientation		
		LAA orientation assists with procedural planning for most advantageous trans-septal puncture location.

Evaluation of LAAO Devices

Dr Julie Humphries

ECHO AUSTRALIA

17-19 March 2025