

Anatomy of LAA and Its Role in Thrombotic Disease: Implications for Prevention

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Disclosure

**Investigator Atritech (Watchman)
Left Atrial Appendage Occlusion**

Atrial fibrillation is a major source of cardiogenic embolism-related stroke

- 750000 strokes per year
- AHA estimates that 15 – 20% of strokes/year are related to AF
- Risk is similar for (p) afib and chronic atrial fibrillation
- CHADS

Left atrial appendage is a major source of thrombi that cause stroke in AF patients

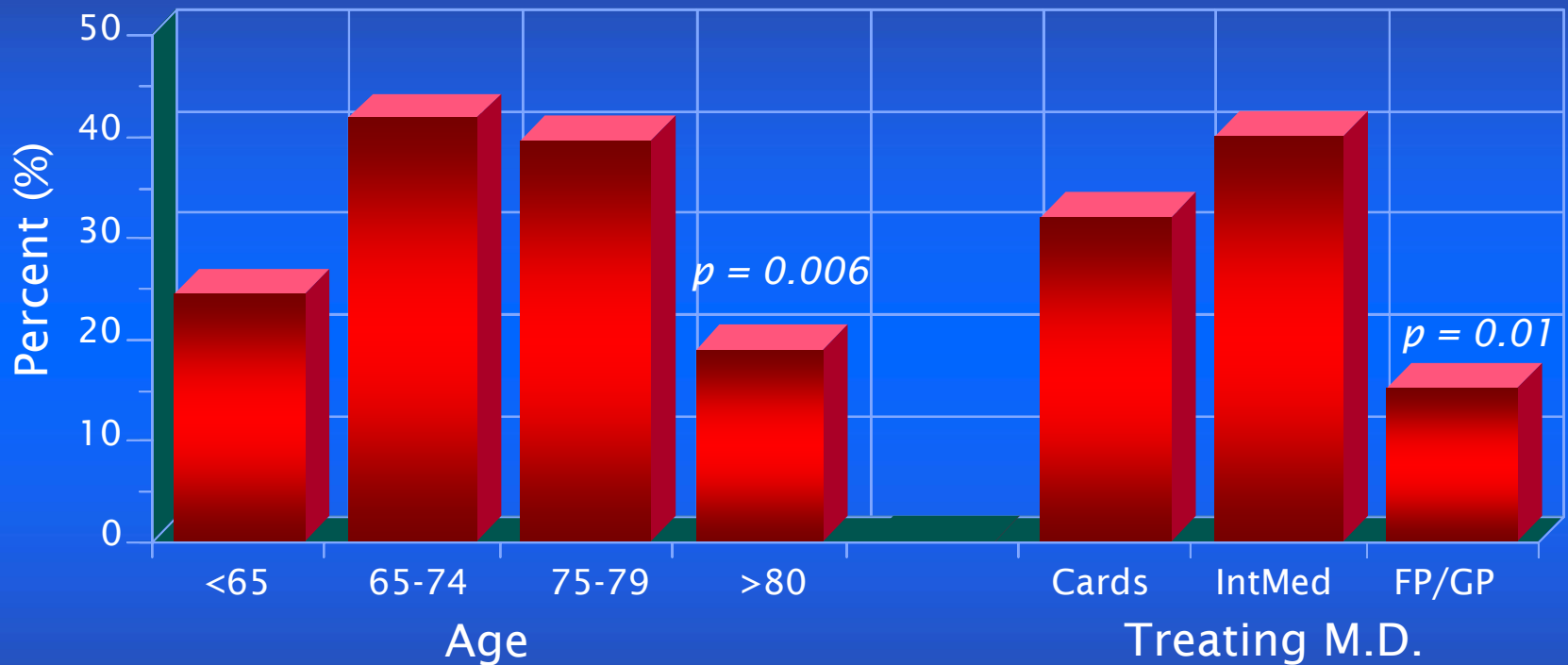
- 91% of all thrombus in patients with AF is found in the left atrial appendage (LAA)
- The four largest TEE studies comprising 1,181 patients showed that 98% of thrombi were found in the LAA

Location of thrombi in non-rheumatic atrial-fibrillation

Setting	Total # of thrombi found in LAA and atrium	Found LAA		Found in left atrium		Reference
		Number	%	Number	%	
TEE	67	66	99%	1	1.5%	Stoddard, JACC '95
TEE	35	34	97	1	2.9	Manning, Circulation '94
Autopsy	47	35	74	12	25.5	Aberg, Acta. Med. Scan. '69
TEE	4	2	50	2	50.0	Tsai, JFMA '90
TEE	13	12	92	1	7.7	Klein, Int J. Card. Imag. '93
TEE & operation	11	8	73	3	27.3	Manning, Circulation '94
SPAF III ¹ & TEE	20	19	95	1	5.0	Klein, Circulation '94
TEE	19	19	100	0	0.0	Leung, JACC '94
TEE	6	6	100	0	0.0	Hart, Stroke '94
Total	222	201	91%	21	9.5%	

¹ SPAF III stands for "Stroke Prevention in Atrial Fibrillation III"
Source: *The Annals of Thoracic Surgery*, 1996, 61:755-9

Utilization of Warfarin



What do we know about the LAA?

Thinner and more compliant than LA

Highest concentration of ANP (40X) in body

Likely involved in :

- Volume regulation

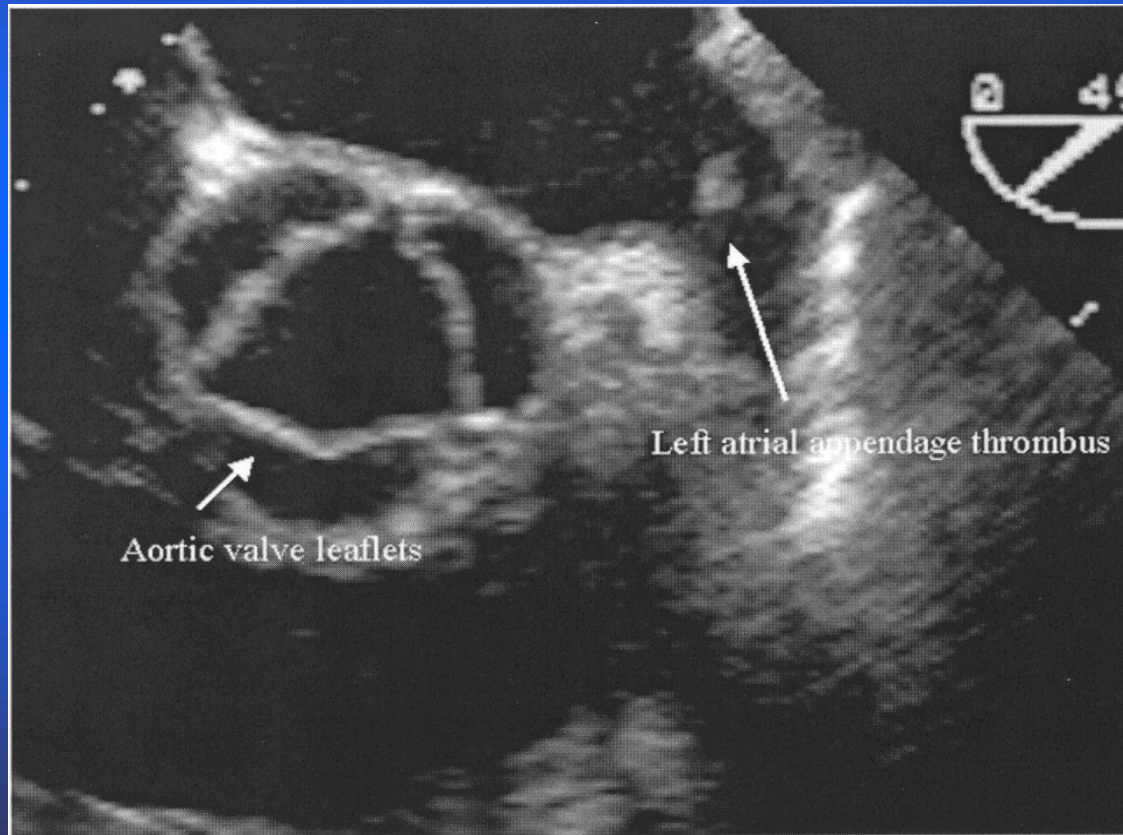
- LV filling

LAA

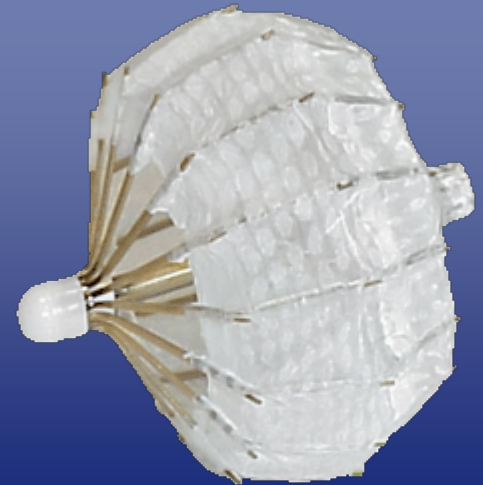
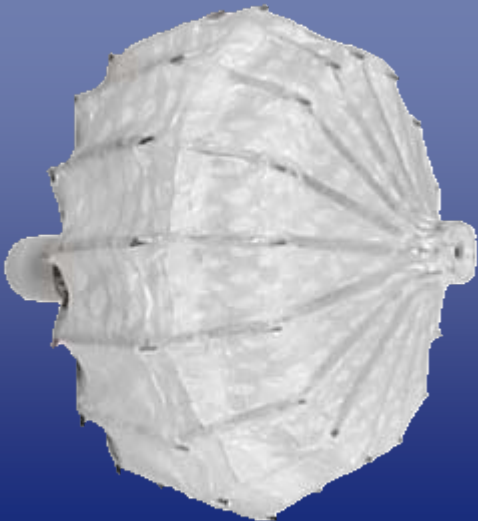
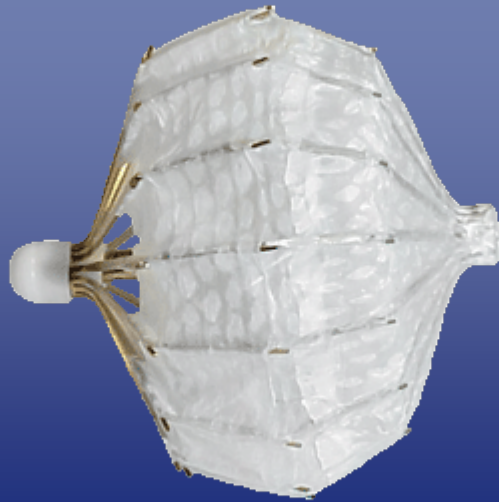
LAA anatomy is complex and bizarre
varies considerably based on
volume status and rhythm

LAA remodeling (chronic AF) causes:
dilation, pectinate muscle reduction
flow stasis>>>>clots

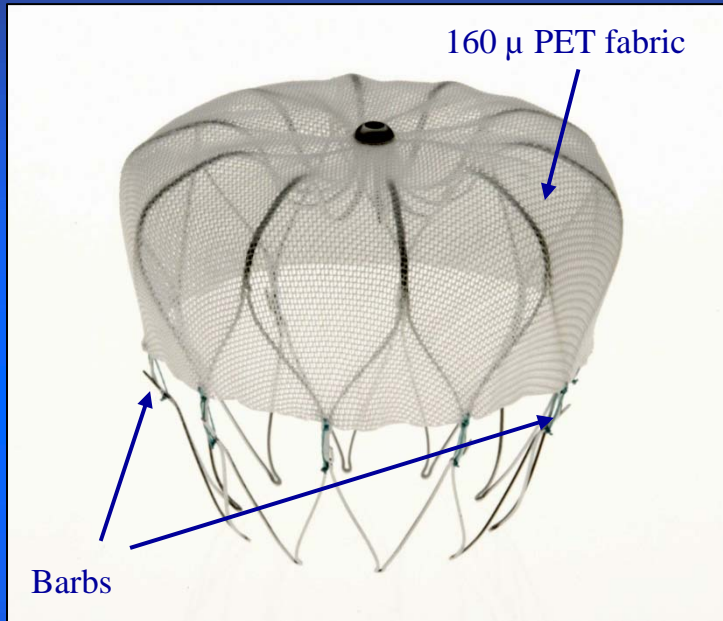
Thrombi Formation in the LAA



PLAATO Implant

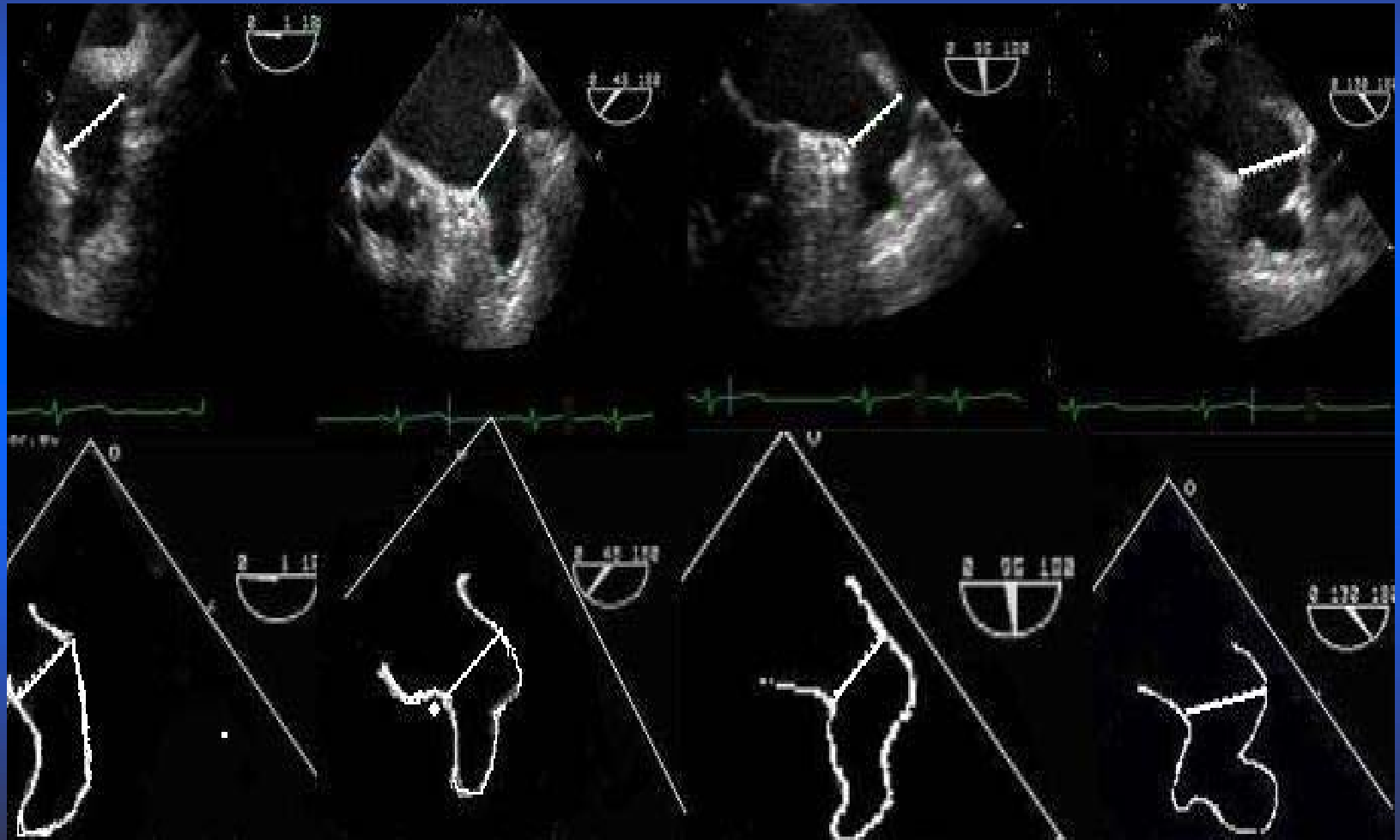


WATCHMAN® Device



- Device available in various sizes:
 - 21, 24, 27, 30 and 33 mm (diameter)
 - Device diameter is measured across face of device
- Frame: Nitinol (shape memory)
 - Contour shape accommodates most LAA anatomy
 - Barbs engage the LAA tissue
- Fabric Cap: Polyethyl terephthalate (PET) Fabric
 - Prevents harmful emboli from exiting during the healing process

LAA Dimensions



Echocardiography

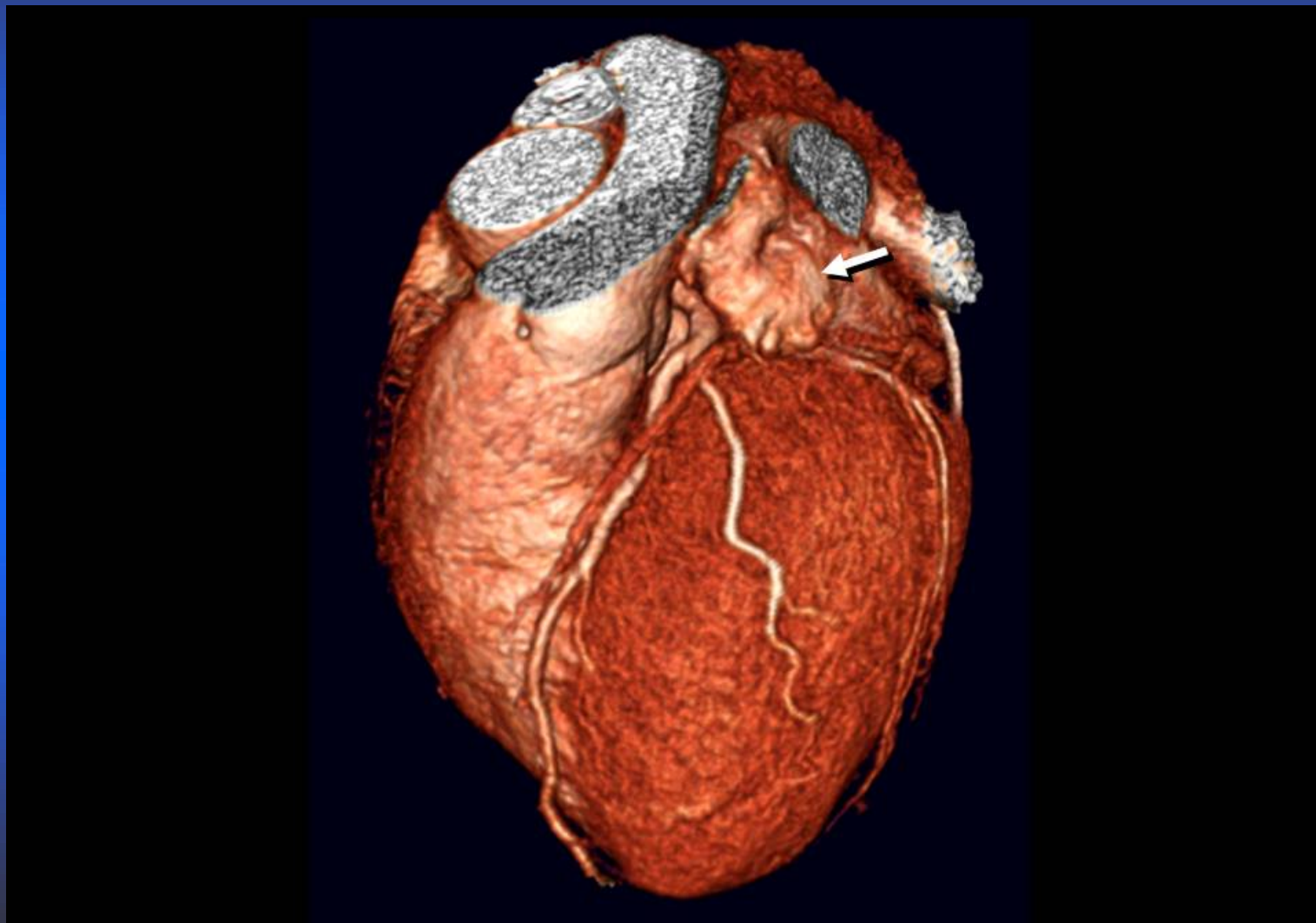
Transesophageal LAA Occluded





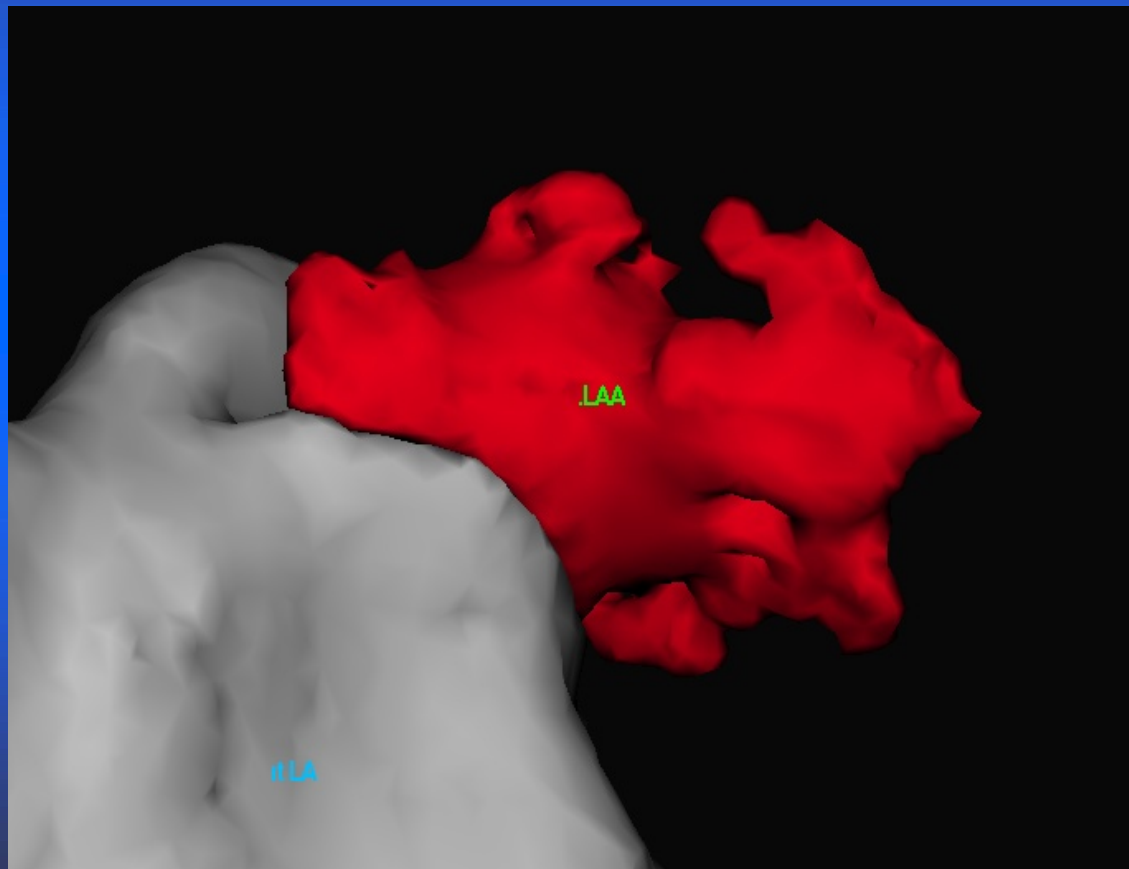
External View of LAA

3D CTA



3D CTA

Multiple Lobes



Summary

LAA anatomy is complex/variable

LAA function

- Little is known

- Pts can function without it

Source of Thrombi in Atrial Fibrillation

Newer sources of imaging and navigation will make LAA exclusion more common