

PFO Closure

Step by Step and Advanced Tips



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Echo guidance?

	TEE	ICE	TTE	No echo
Echo Image quality	Good	Good	Poor	No
General anesthesia	Y	N	N	N
Venous access number	1	2	1	1
Procedure time	Long	Medium	Short	Short
Monitoring of device deployment	Good	Good	Poor	No
Risk of embolization	Low	Low	Low	higher
Cost	Medium	High	Low	Low
Risk of GI upset or bleeding	Y	N	N	N

Steps

1. Venous access
2. Heparin
3. Right heart catheterization ?
4. Contrast bubble test, TCD ?
5. Cross PFO
6. Wire in LUPV
7. Balloon sizing ?
8. Select type and size of device
9. Long sheath
10. Deploy device
11. Confirm position
12. Release device

Step 1: Venous access

- Femoral vein
 - One sheath: TEE, TTE, No echo guidance
 - Two sheaths: ICE (8 or 10 F)



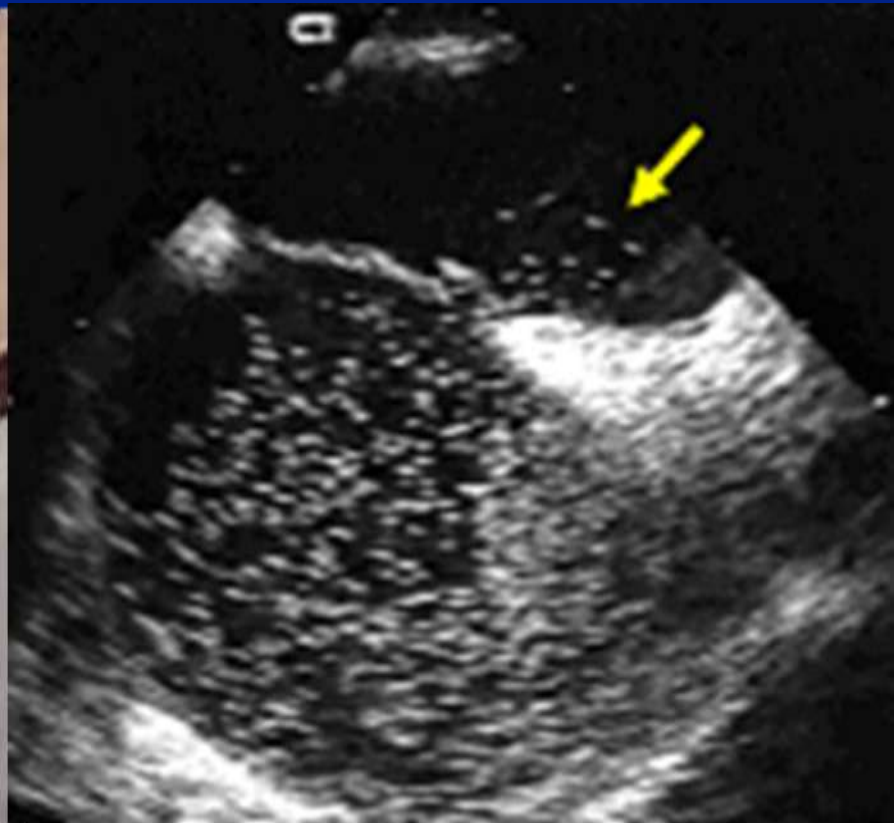
Step 2: Heparin

- 50-100 u/kg
- 5000 u for adult

Step 3: Right heart catheterization ?

- Measure the pulmonary artery pressure
- Check Q_p/Q_s

Step 4: Contrast bubble test ?

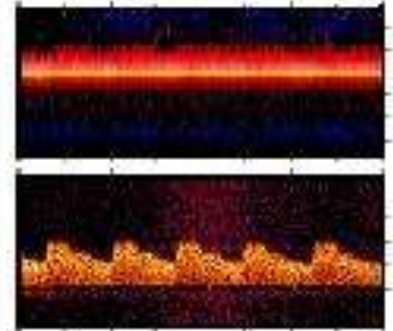


Transcranial Doppler (TCD) ?



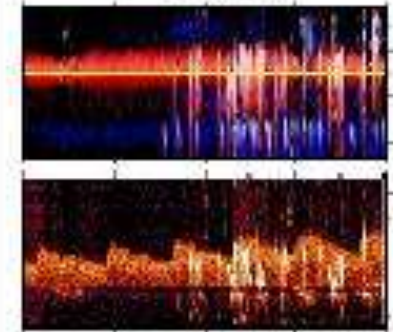
1

normal



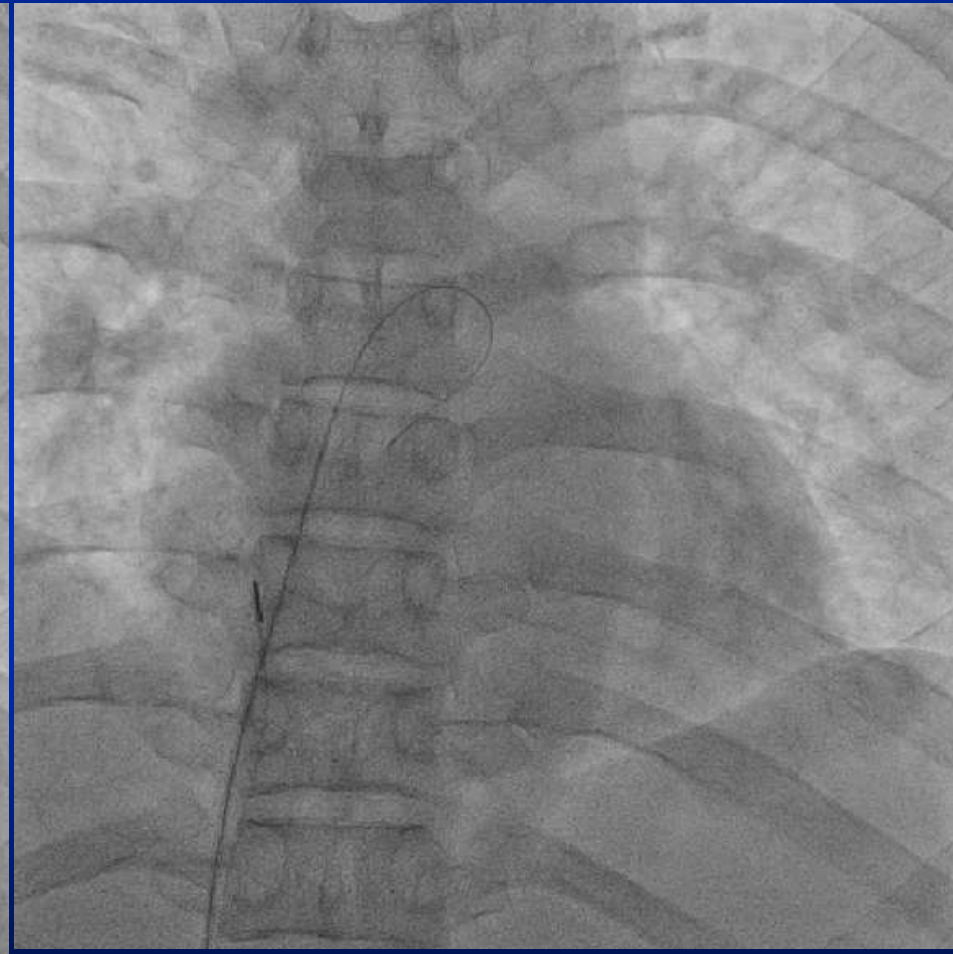
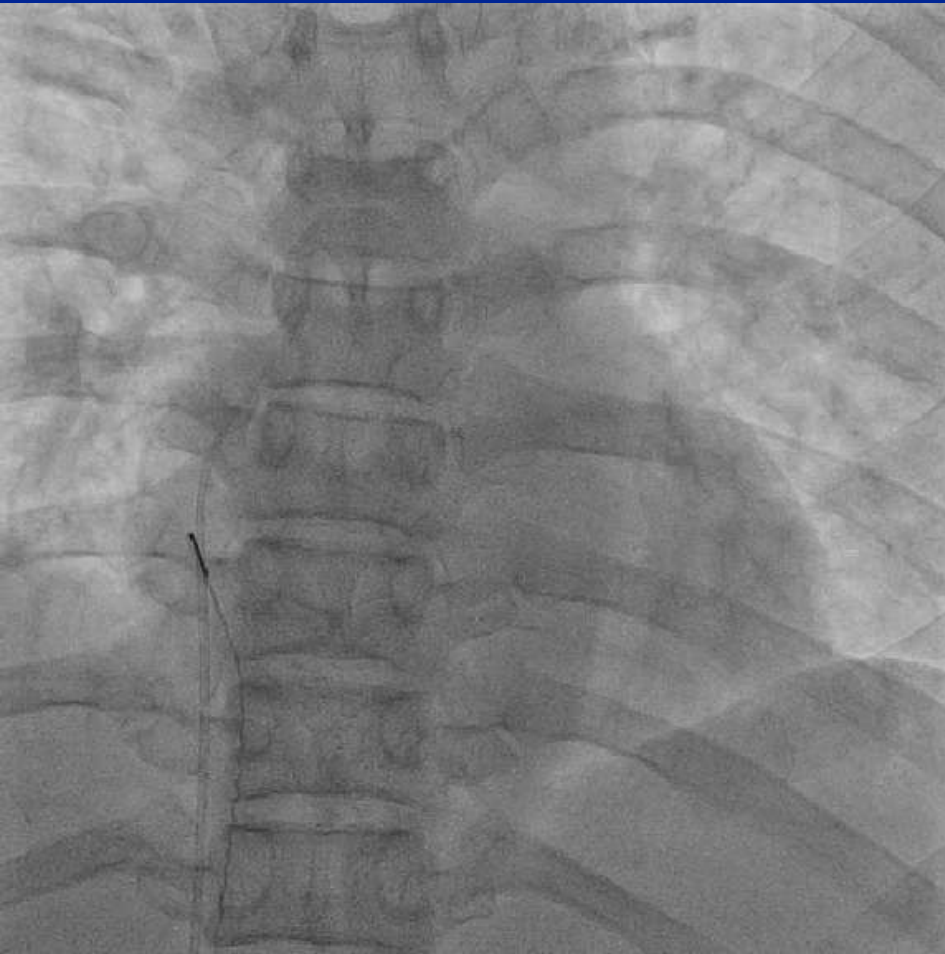
2

PFO



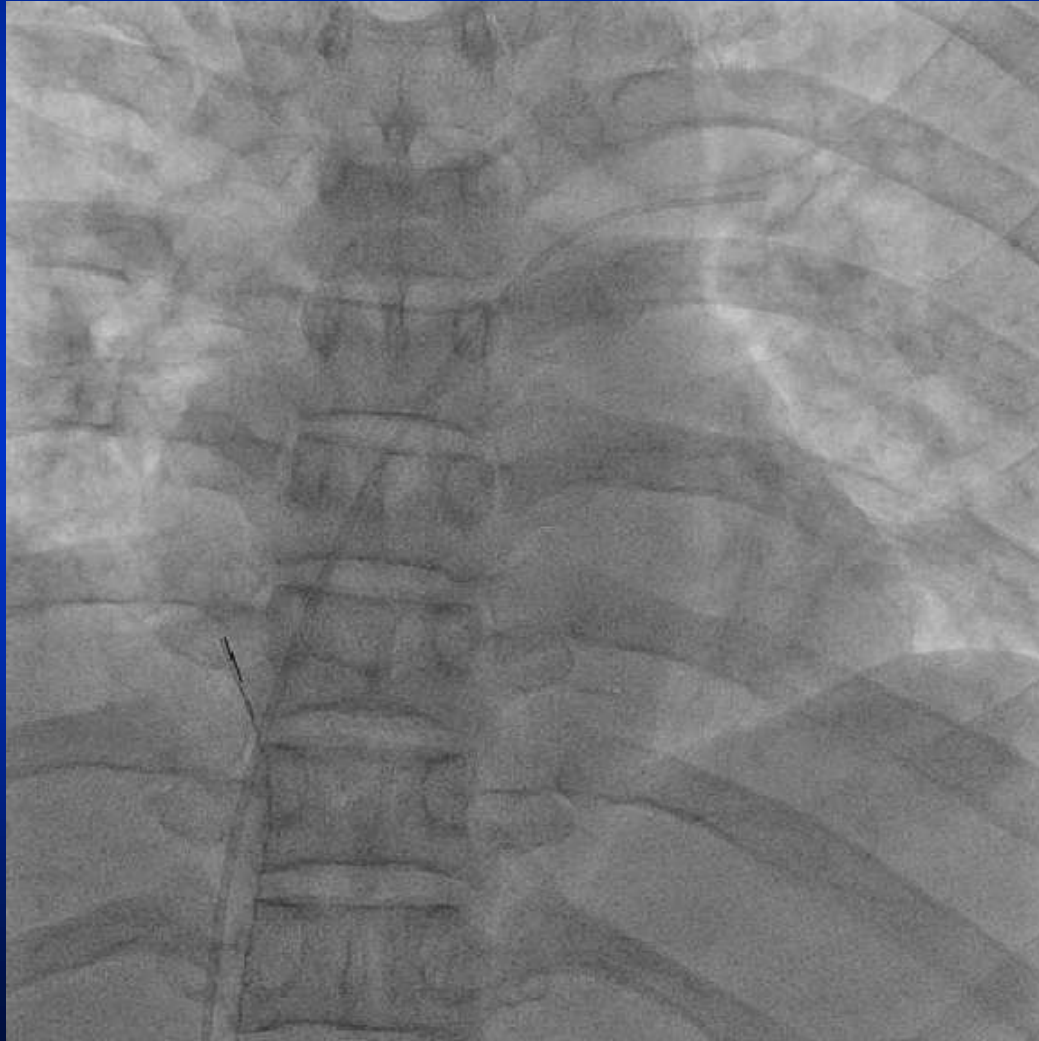
Step 5: Cross PFO

- 6F multipurpose catheter
- 0.035-in Terumo glide wire



Step 6: Wire in LUPV

- 0.035-in exchanged length superstiff wire
- Avoid trauma to pulmonary vein

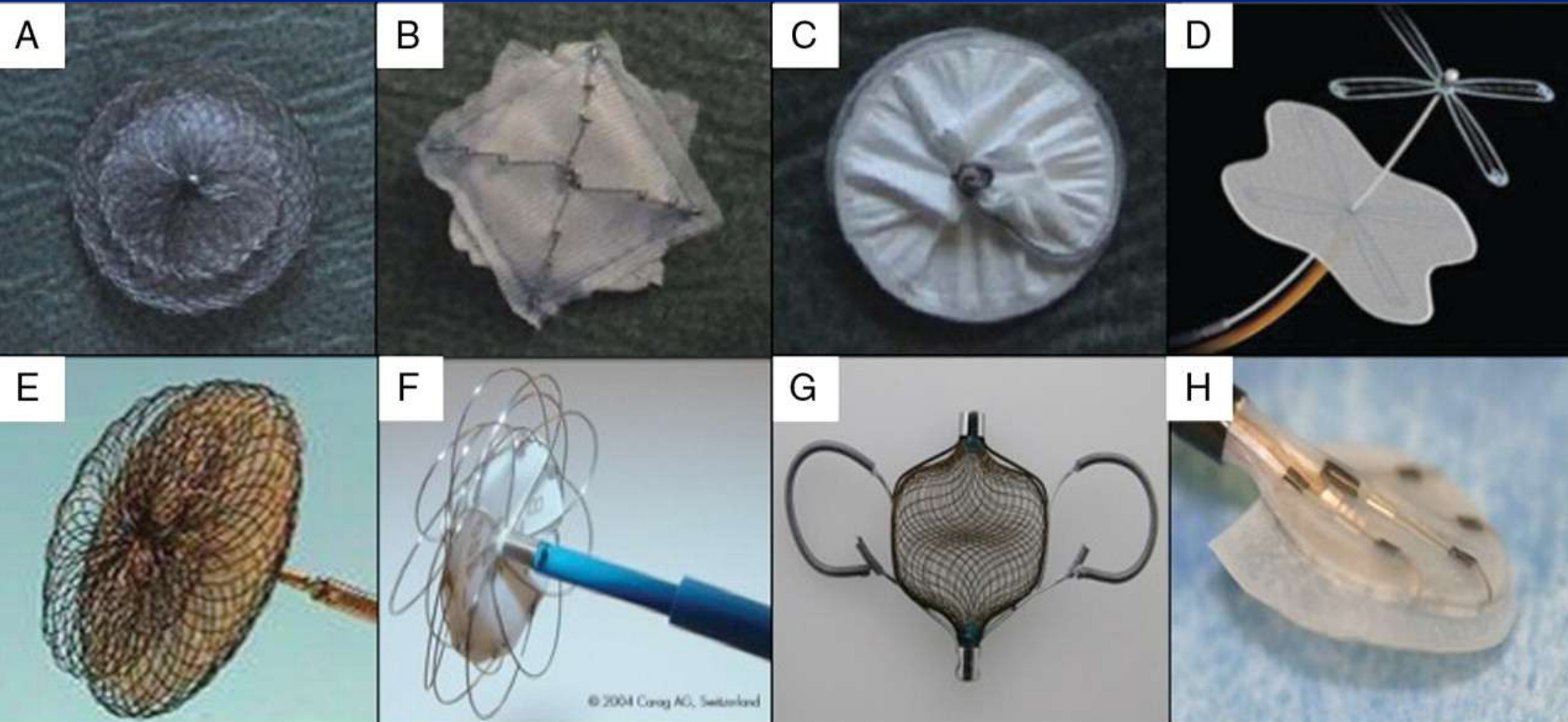


Step 7: Balloon sizing ?

- Help to define the size of PFO
- Help to define the length of tunnel
- Help to rule out other defects
- Help to define the septal anatomy by decreasing the extent of motion of the atrial septum in patients with thin and aneurysmal septum

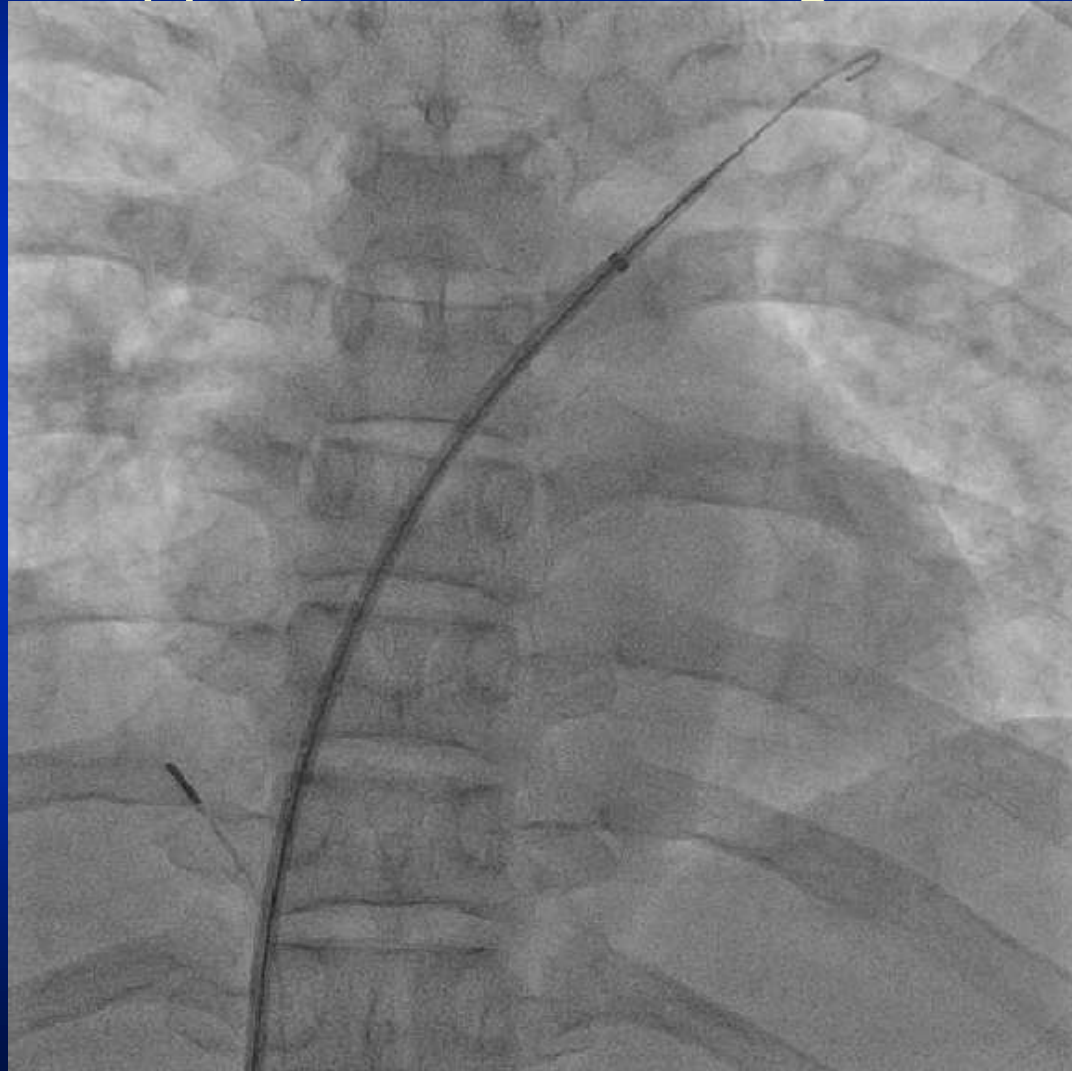
Amin. *Ann Pediatr Cardiol.* 2010 ;3(1): 35–39.

Step 8: Select type and size of device



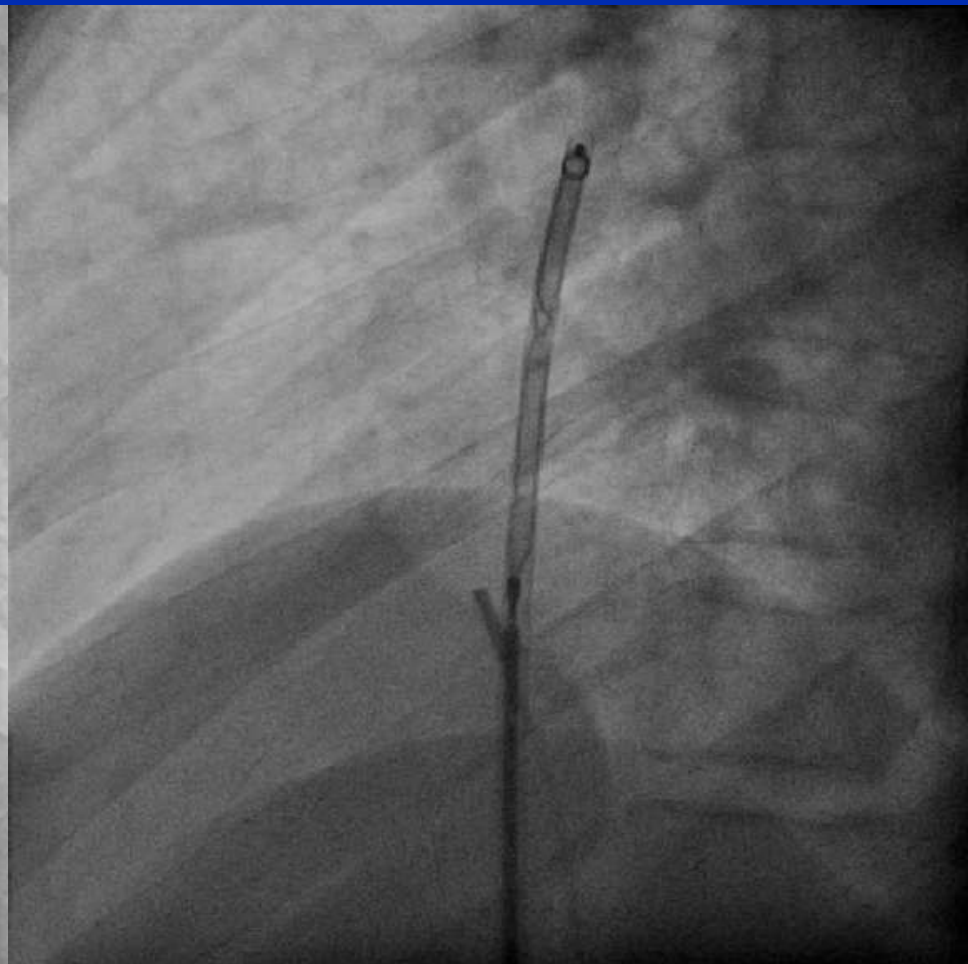
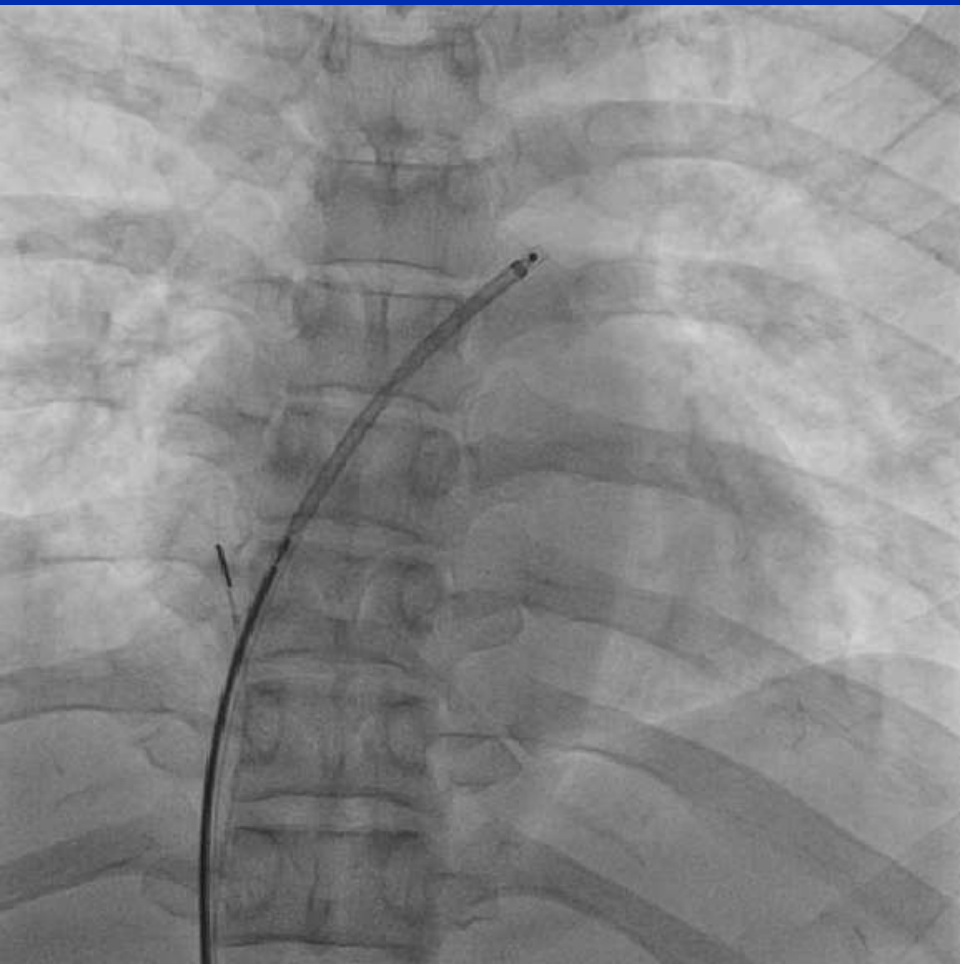
Step 9: Long sheath

- Advance an appropriate sized long sheath in LUPV



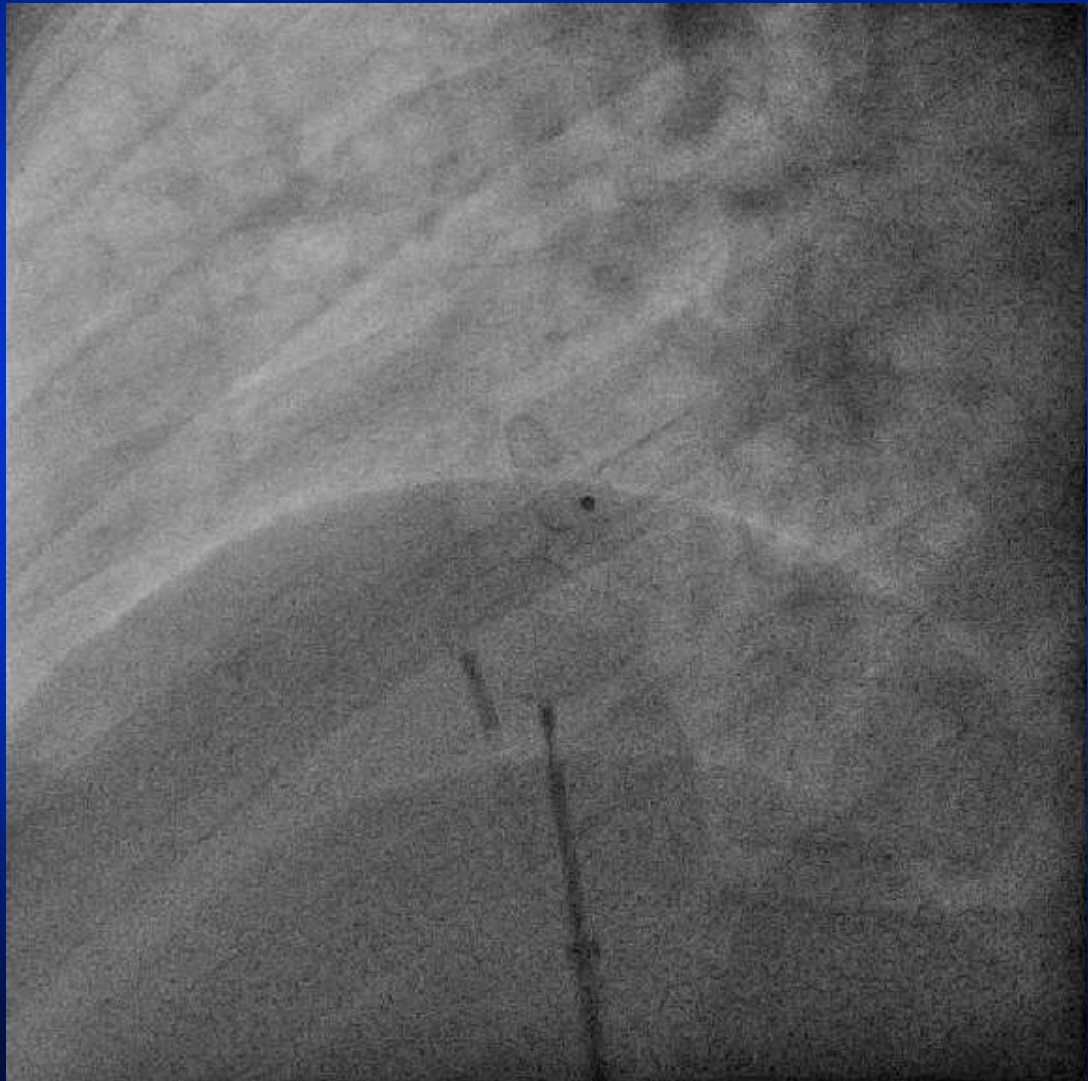
Step 10: Deploy device

- The left disc in LA
- Pull the sheath and left disc against the septum
- Retract the sheath and deploy the right disc

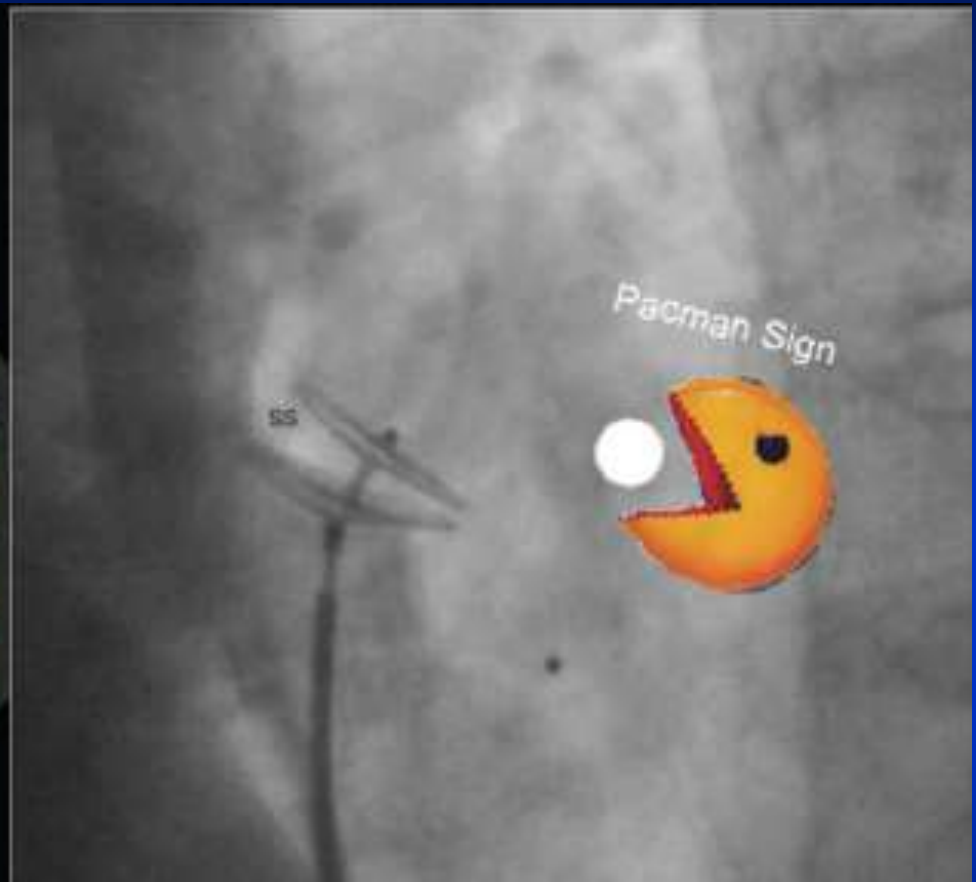


Step 11: Confirm position

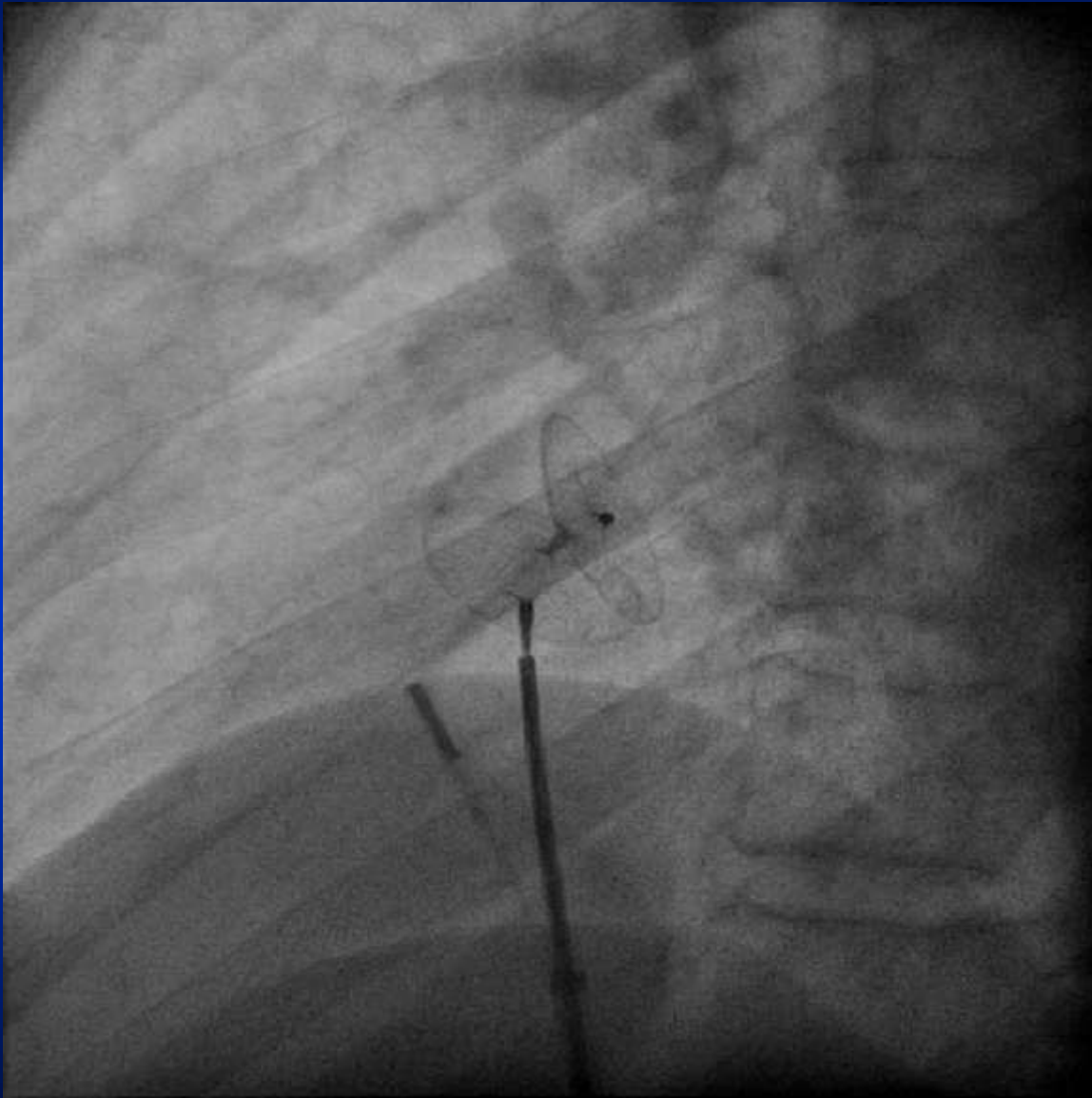
- Echo: the right disc overlaps the limbus
- Wiggle test



Pacman sign of Amplatzer PFO occluder



Step 12: Release device



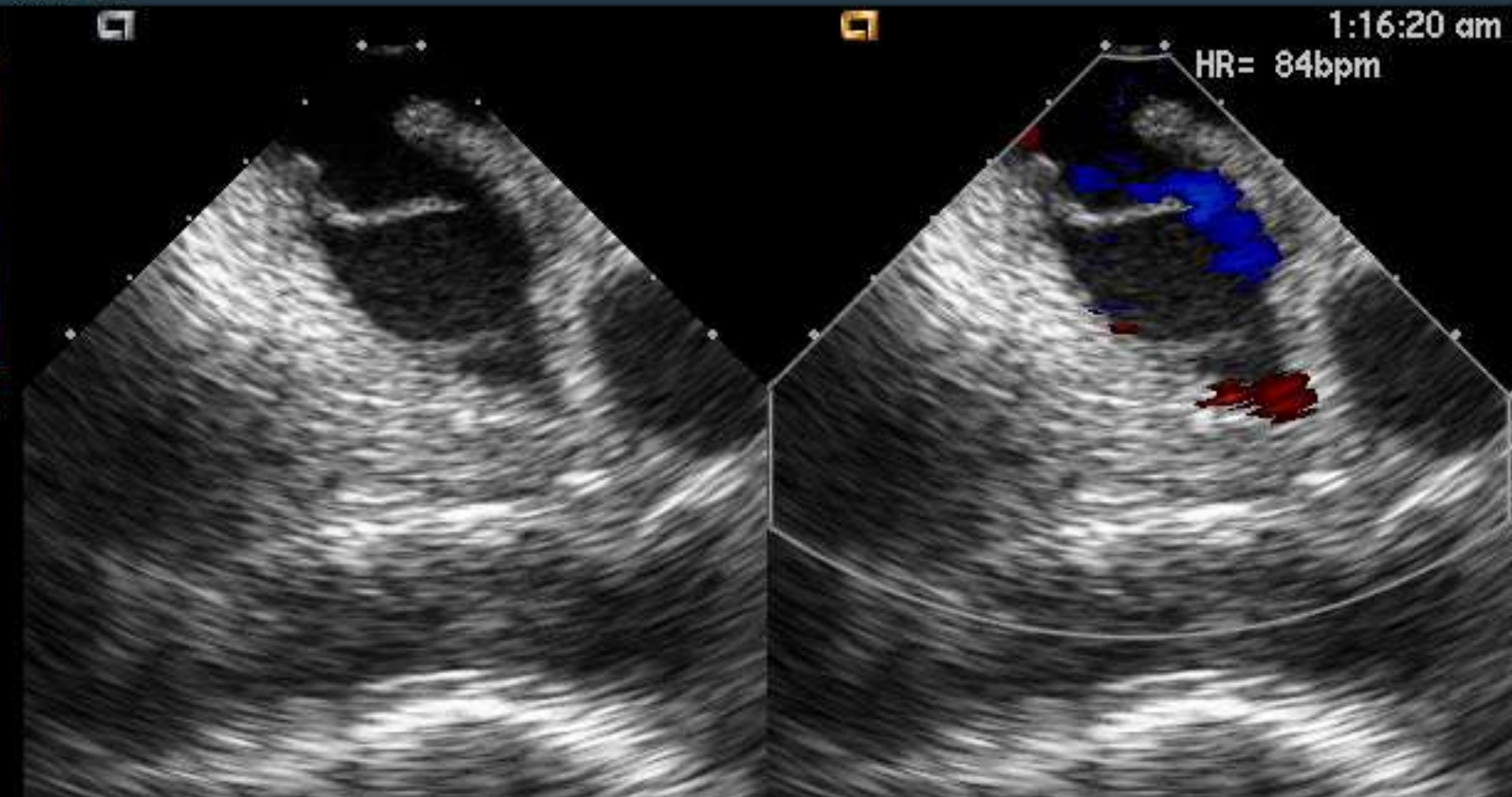
83 y/o woman

PFO was considered as a small ASD
in other hospital

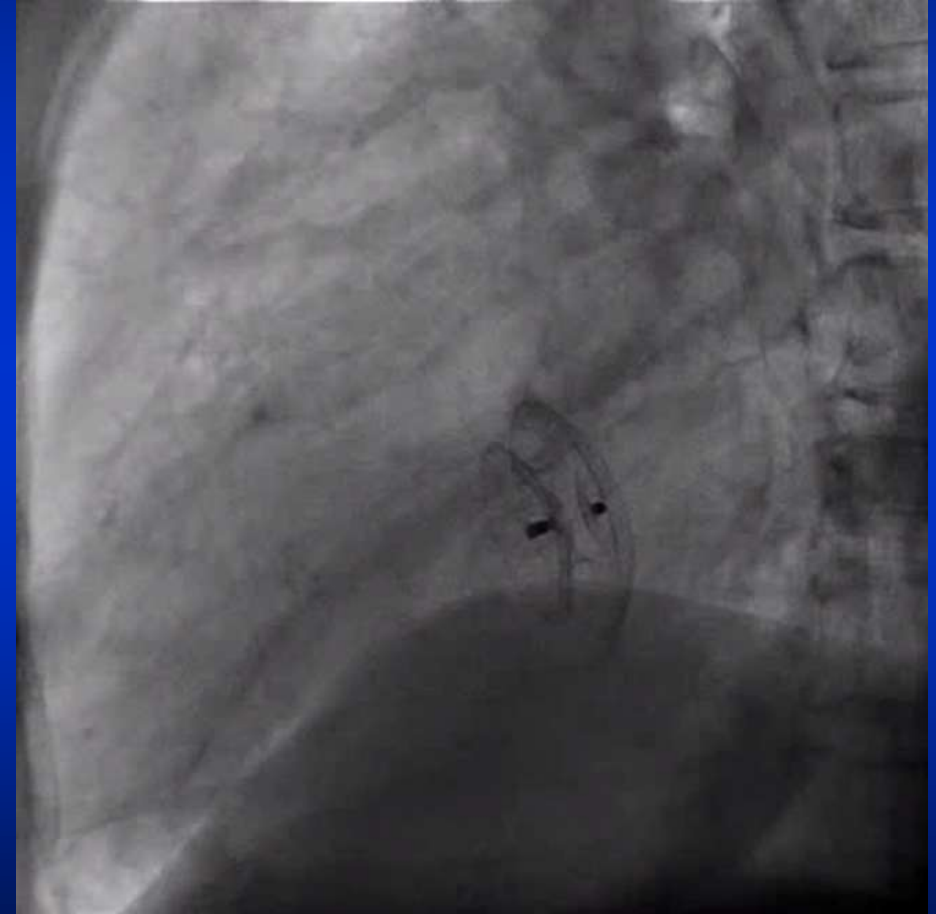


3027-ASD: 000706355A
VGH-TC

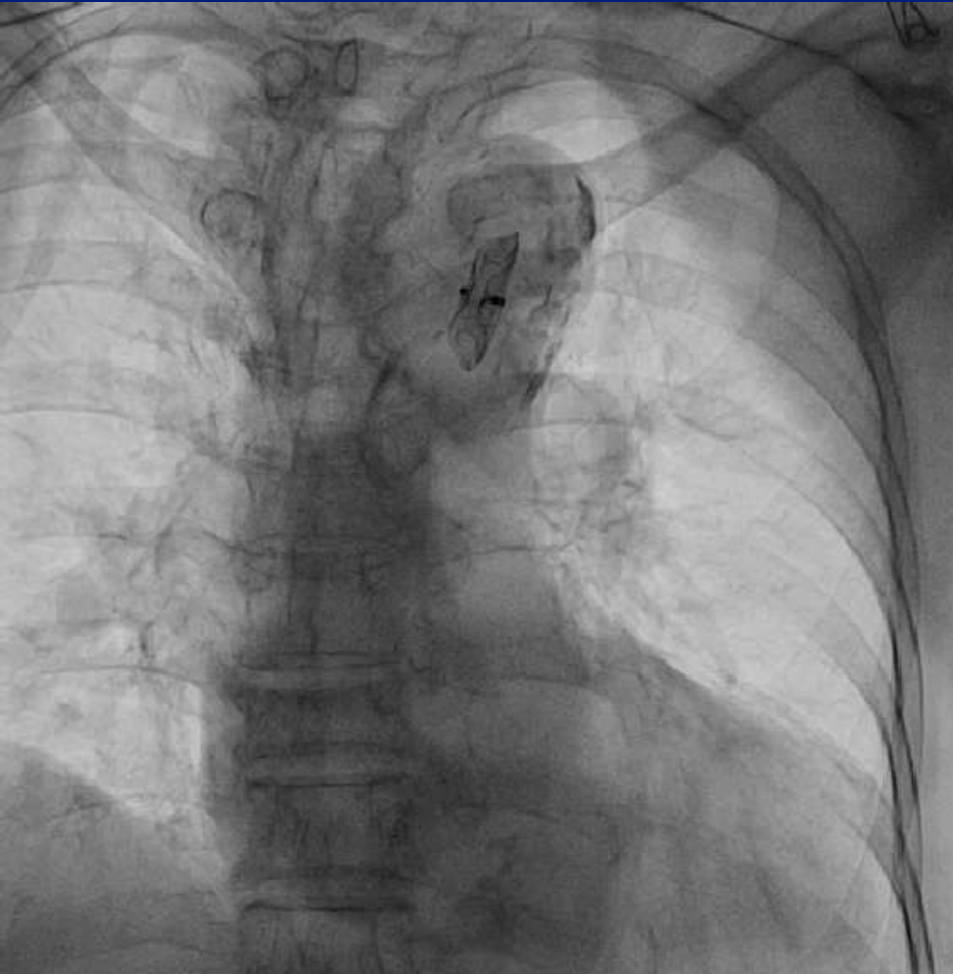
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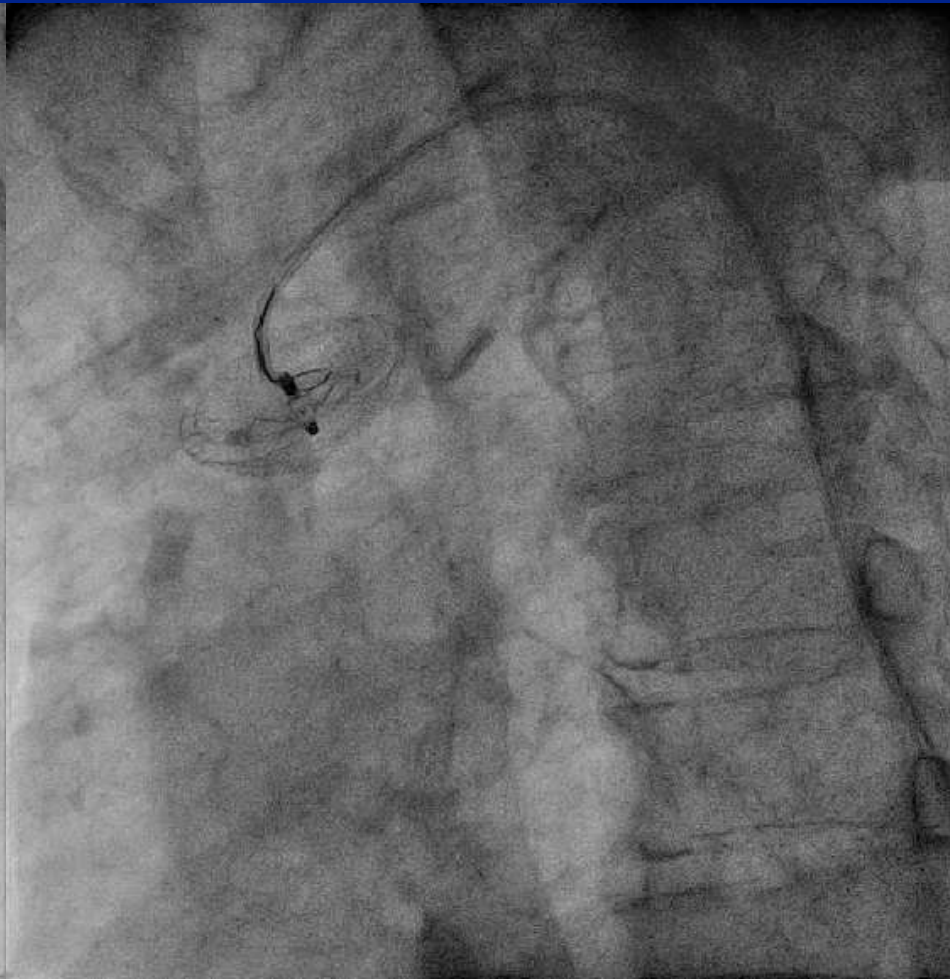
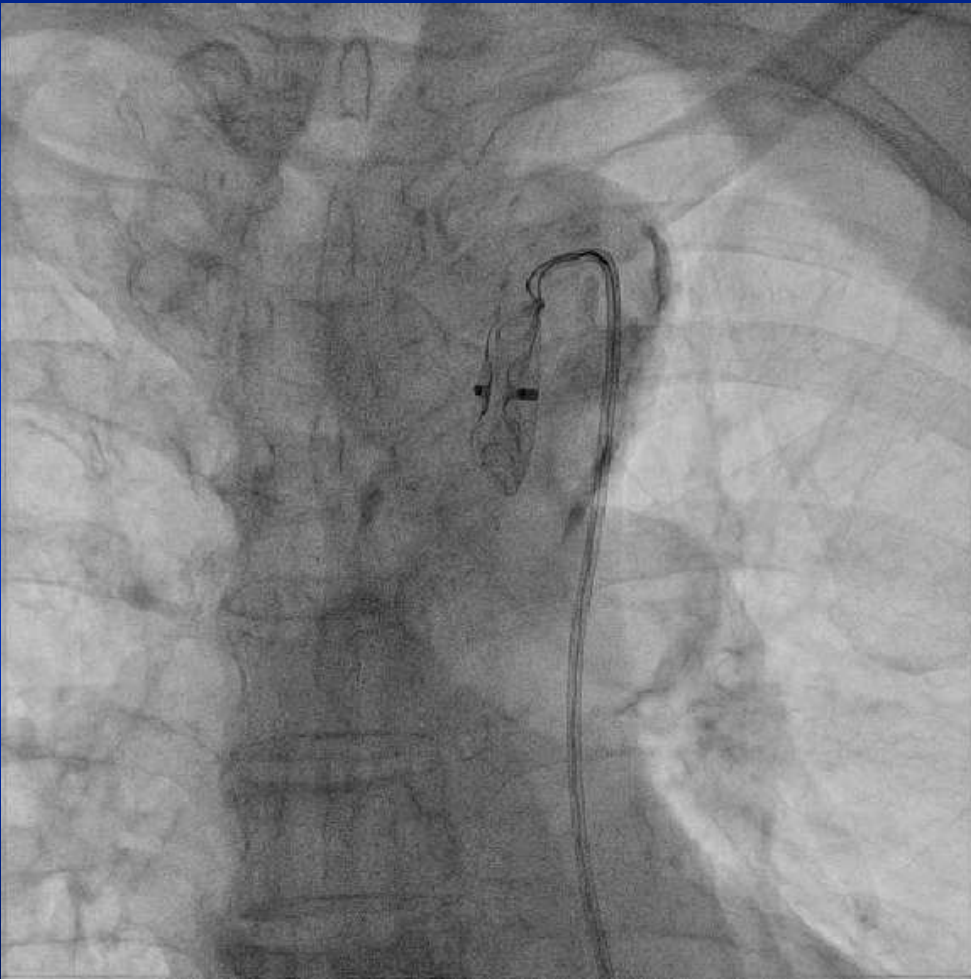


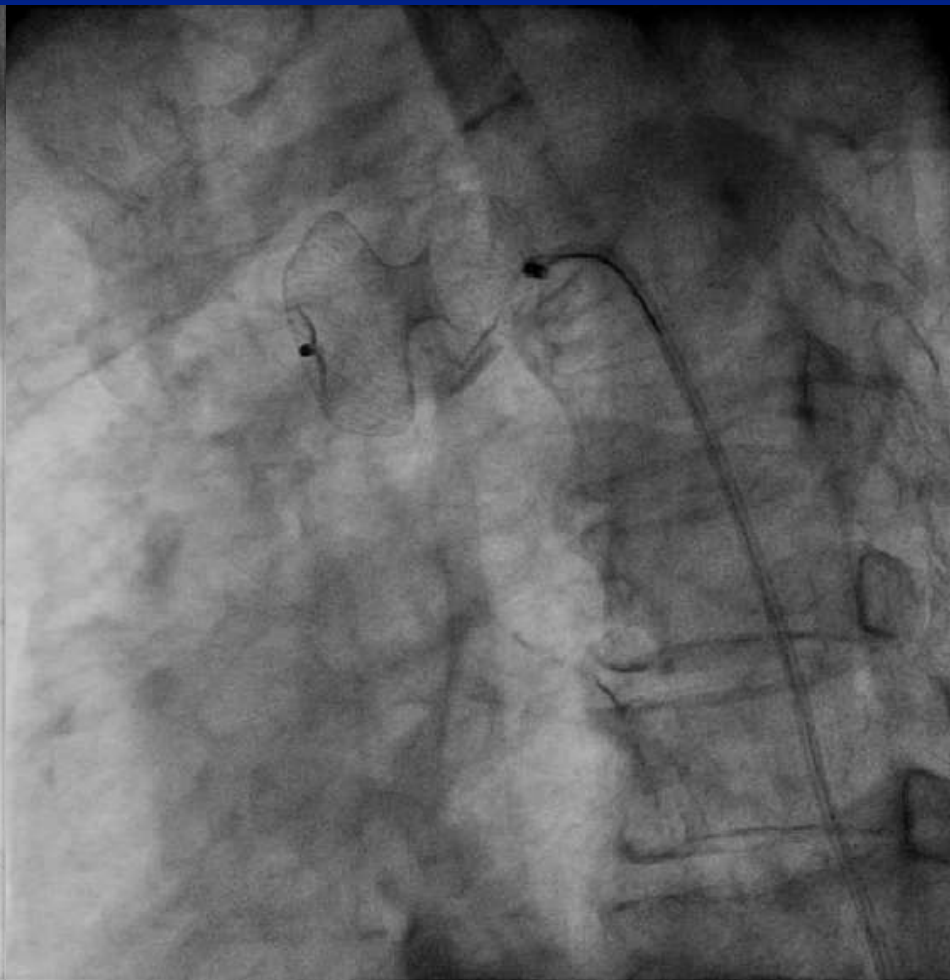
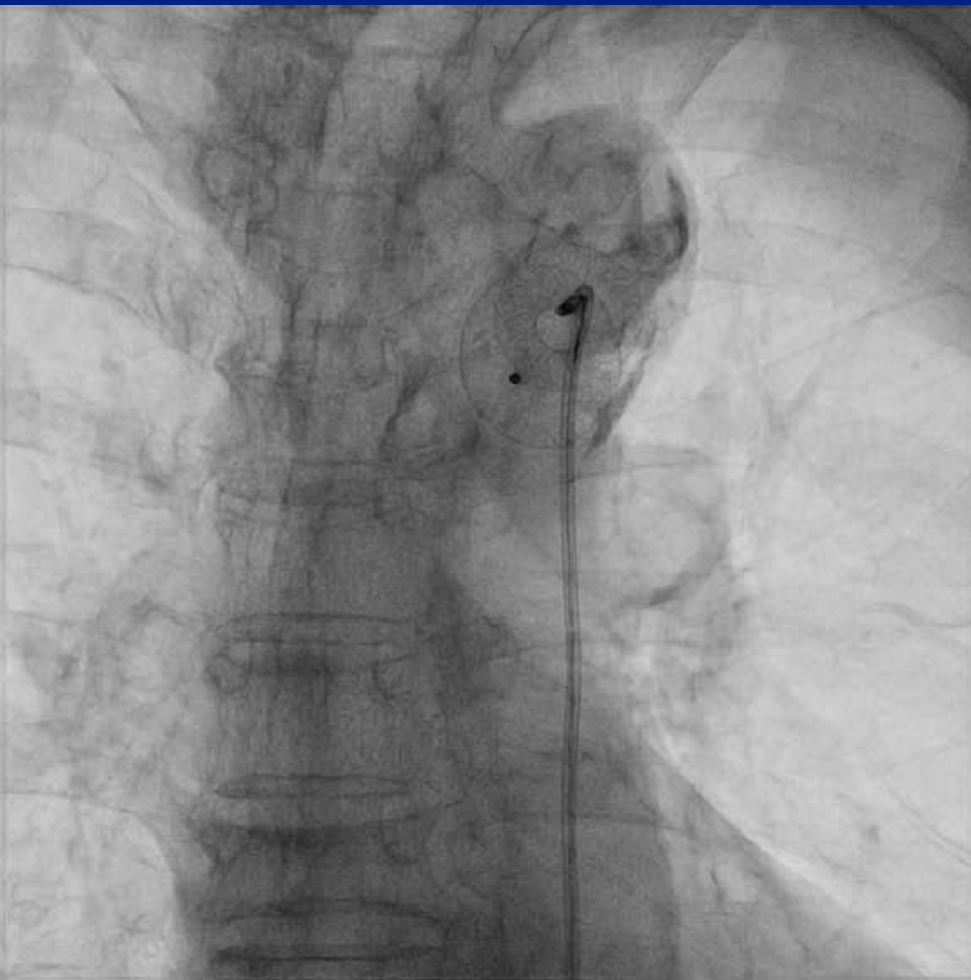
After balloon sizing, they deployed a 12 mm Amplatzer septal occluder



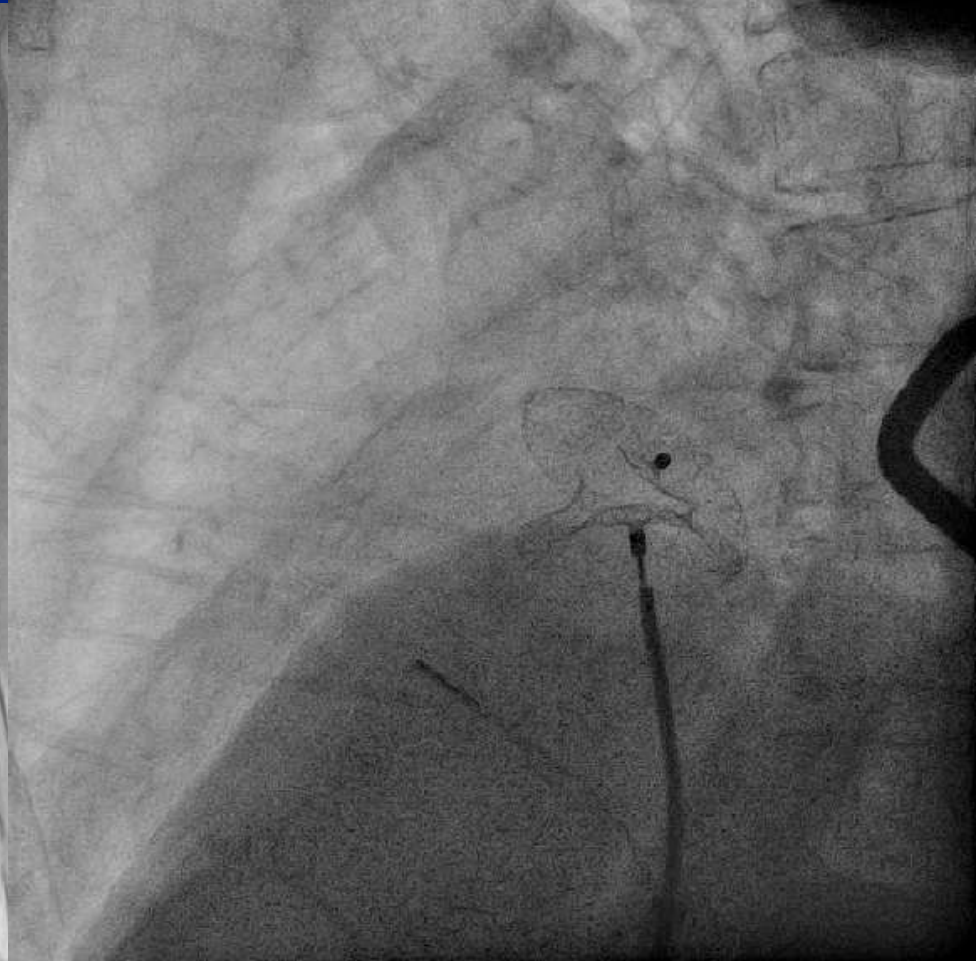
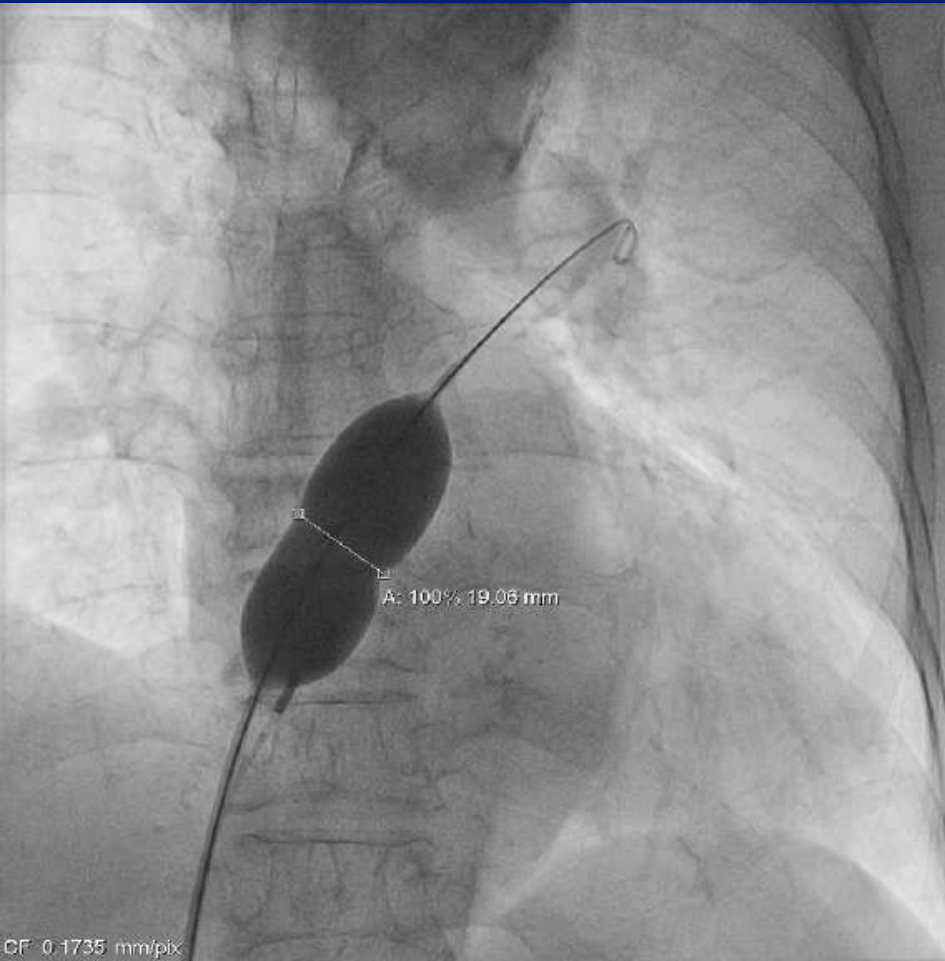
Device was embolized into AO







Balloon sizing: 19 mm



Conclusions

- PFO is not SMALL ASD
- To close PFO
 - is usually straightforward and easy
 - but maybe challenging for PFO with
 - Long tunnel
 - Large defect
 - Septal aneurysm
 - Associated with other perforation
 - Prominent Eustachian valve