VSD

Position	Pressure (mm Hg)	Oxygen Saturation (%)
SVC	Mean = 6	75
RA	Mean = 6	75
IVC		78
RV	80/0,12	80
PA	80/40, mean = 55	80
PCW	Mean = 5	95
FA	80/54, mean = 62	95

SVC, superior vena cava; RA, right atrium; IVC, inferior vena cava; RV, right ventricle; PA, pulmonary artery; PCW, pulmonary capillary wedge; FA, femoral artery.

How much Qp? How much Qs?

$$Q_p/Q_s = \frac{\text{Aorta} - \text{mixed venous}}{\text{Pulmonary vein} - \text{pulmonary artery}}$$

$$Q_p/Q_s = 95\% - 75\%/95\% - 80\% = 20/15$$

A. 1.33

B. 1.50

C. 1.75

D. 2.00

E. 2.25

Position	Pressure (mm Hg)	Oxygen Saturation (%)
SVC	Mean = 6	75
RA	Mean = 6	75
IVC		78
RV	80/0,12	80
PA	80/40, mean = 55	80
PCW	Mean = 5	—
FA	80/54, mean = 62	95

SVC, superior vena cava; RA, right atrium; IVC, inferior vena cava; RV, right ventricle; PA, pulmonary artery; PCW, pulmonary capillary wedge; FA, femoral artery.

The patient then receives 100% oxygen therapy

Position	Pressure (mm Hg)	Oxygen Saturation (%)
SVC	Mean = 6	85
RA	Mean = 6	85
RV	80/0,12	—
PA	80/30, mean = 50	95
PCW	Mean = 5	—
FA	80/54, mean = 62	100

Note: FA blood gas = 7.44, pCO_2 = 37 torr, pO_2 = 525 torr.

How much is the Qp:Qs now?

A. 5.0
B. 4.2
C. 3.7
D. 3.1
E. 2.9

$$Q_p/Q_s = \frac{\text{Aorta} - \text{mixed venous}}{\text{Pulmonary vein} - \text{pulmonary artery}}$$

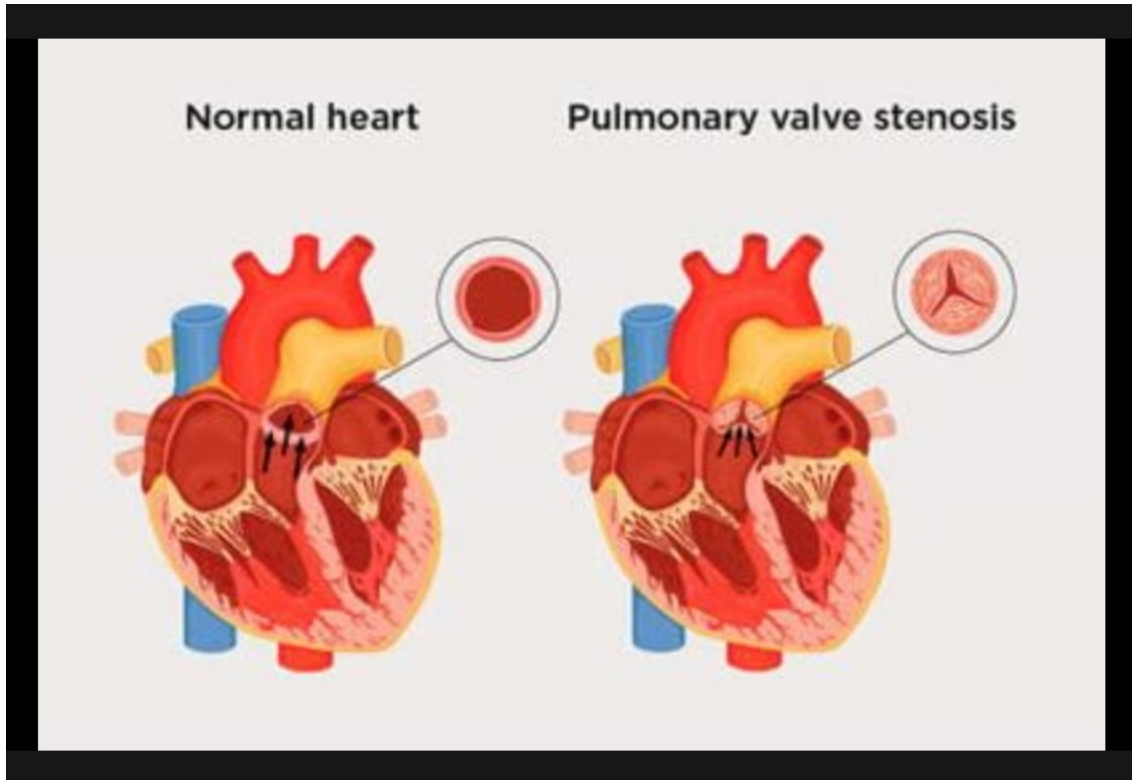
What is it wrong?

Position	Pressure (mm Hg)
RA	Mean = 5
RV	60/8
MPA	60/8
PCWP	Mean = 20
LV	120/24

Severe pulmonary regurgitation !

RA, right atrium; RV, right ventricle; MPA, main pulmonary artery; PCWP, pulmonary capillary wedge pressure; LV, left ventricle.

What I am looking at?

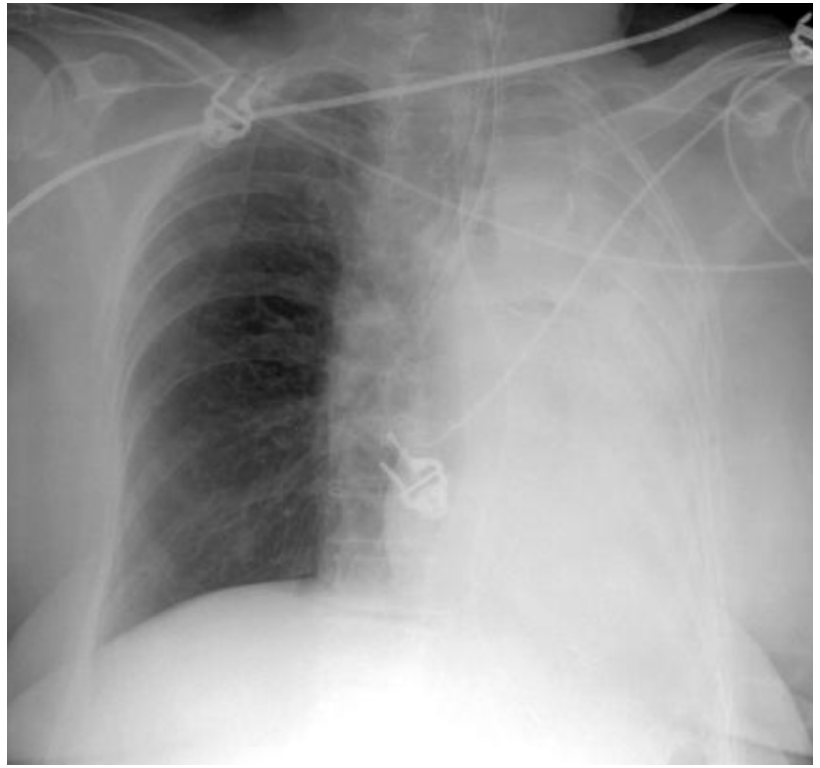


And when it does not make sense?

SVC: 72% / RA: 85% / RV: 83%

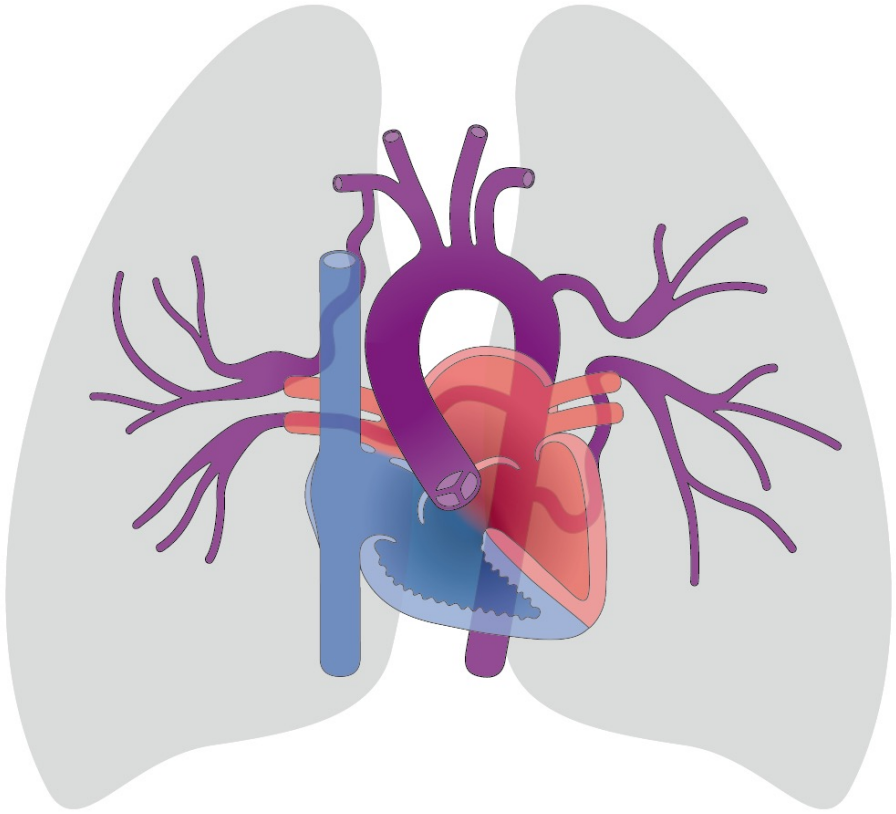
MPA=83% / RPA=84% / LPA0=85%

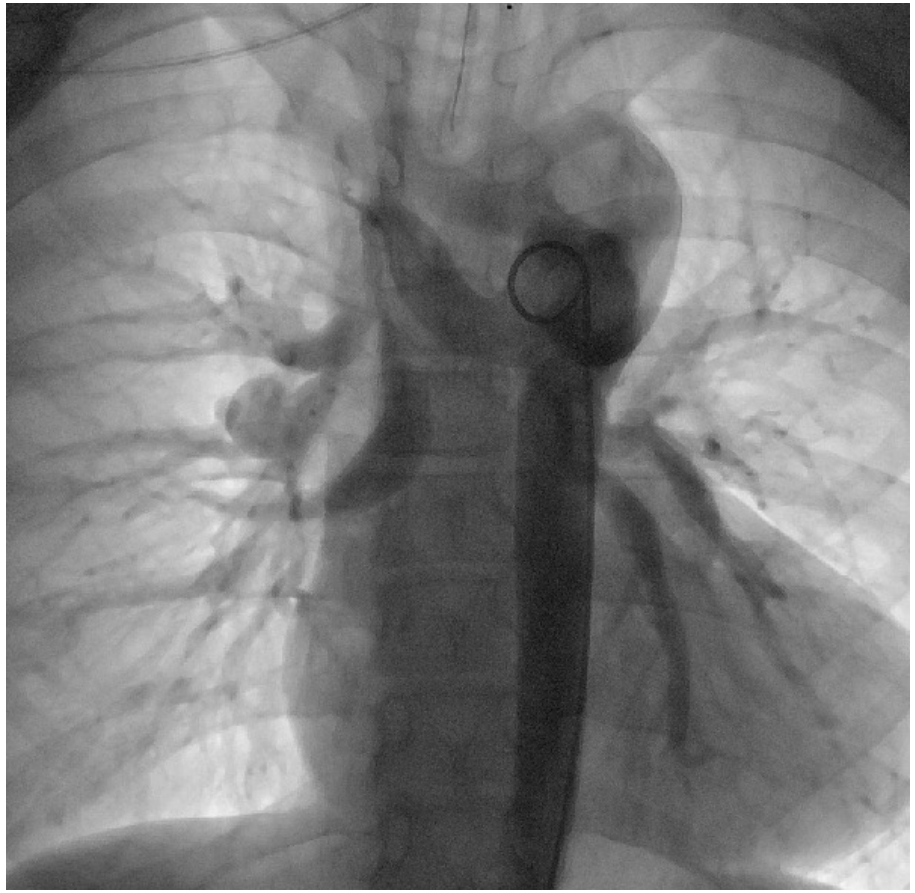
LA=92% / RPV=99% / LPV=83%



Severe cianotic disease

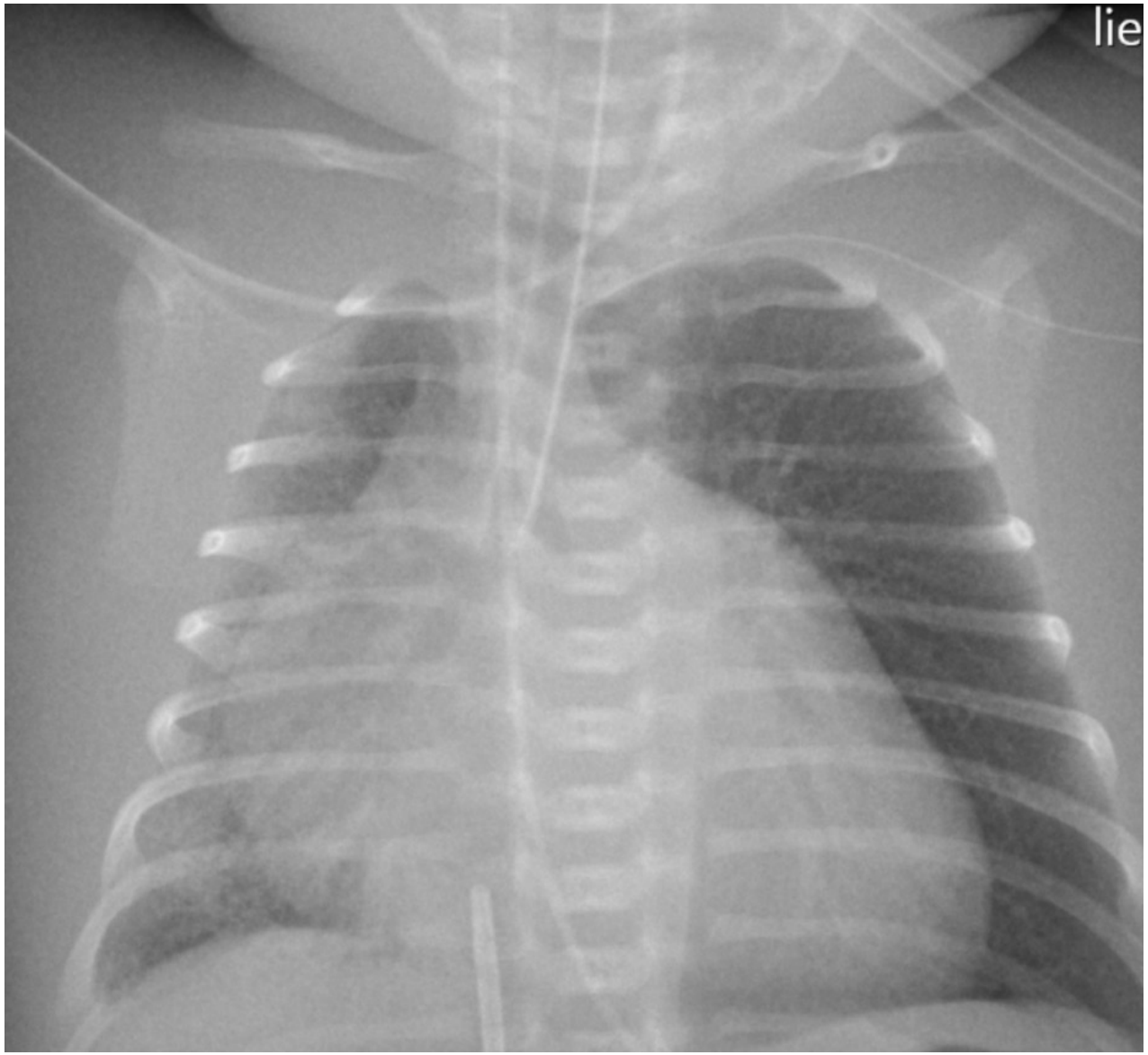
Major aortopulmonary collaterals



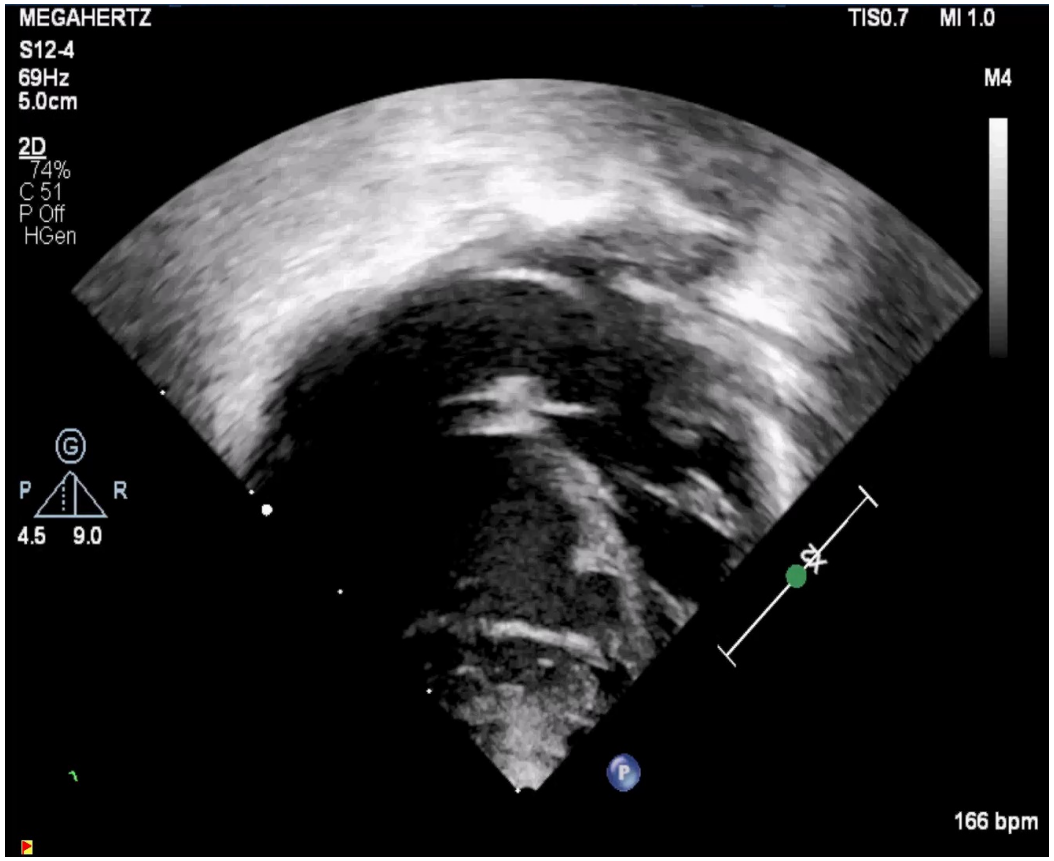


If the heart has no room

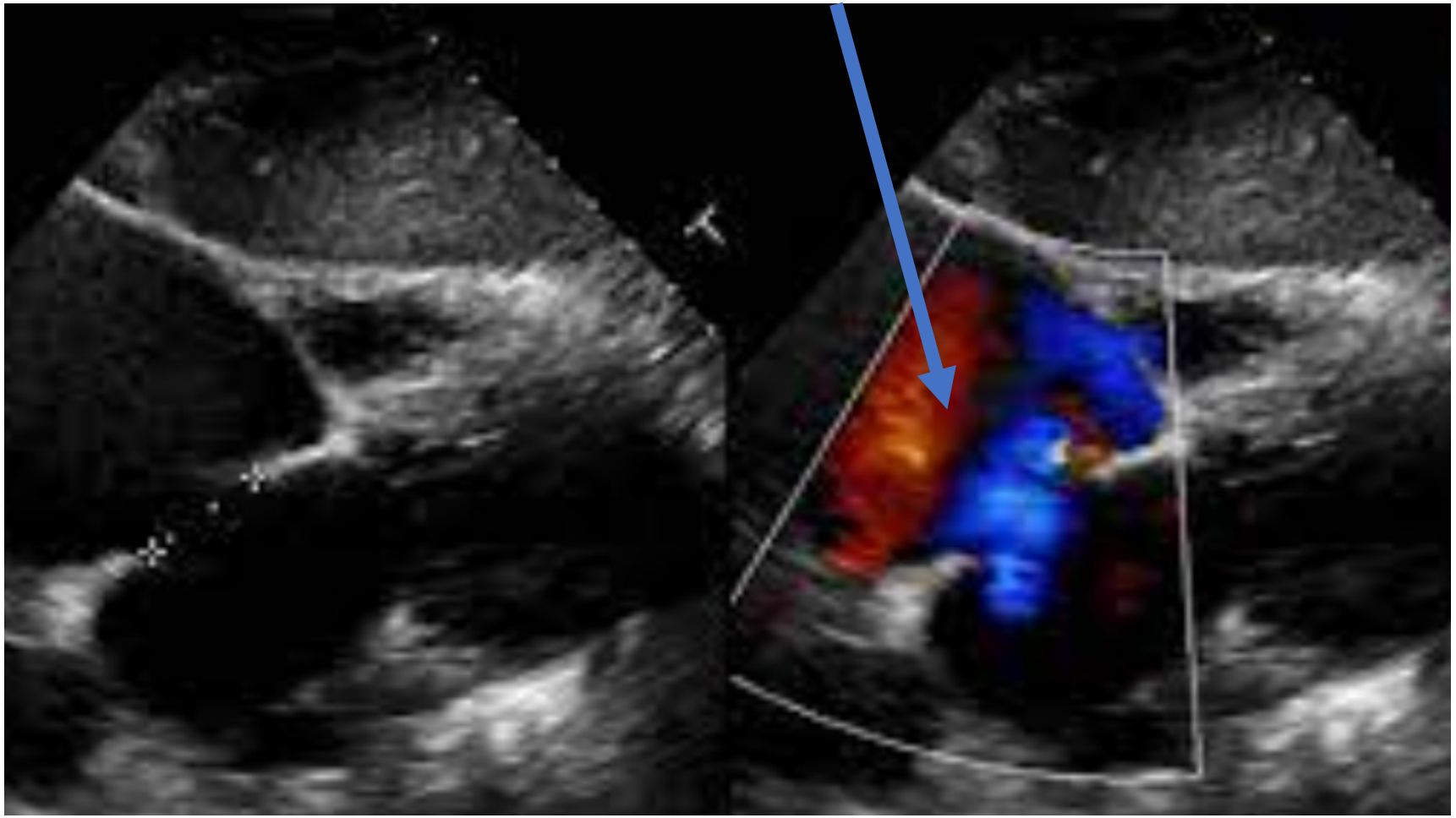
If the heart has no room



Find the difference



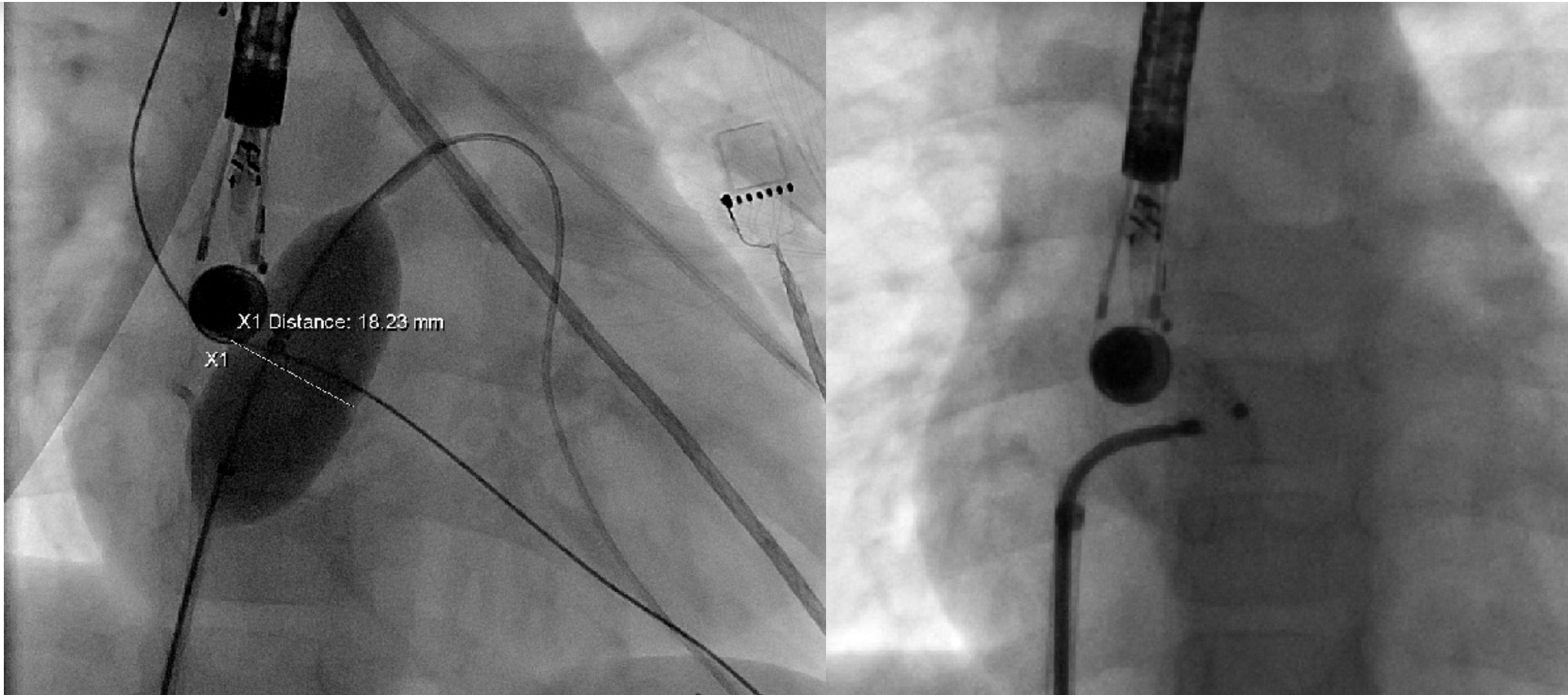
ASD



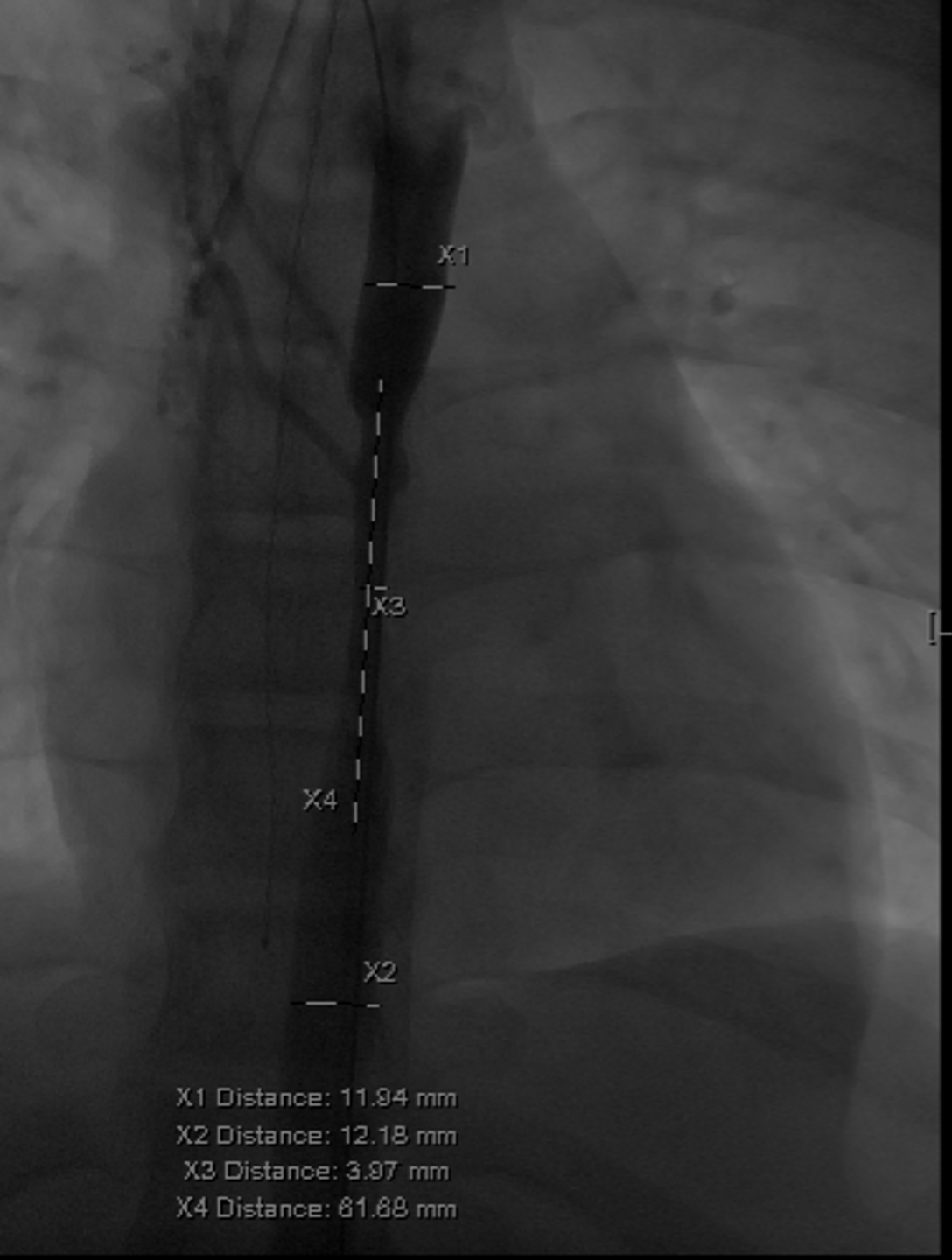
To close or not to close?

	Condition Initiale					Condition Intermédiaire			
	-					Test d'occlusion et remplissage			
	PNI	-				PNI	-		
	Fréquence cardiaque	92				Fréquence cardiaque	93		
	Saturation	90%				Saturation	90		
	FiO2	-				FiO2	21%		
	NO	-				NO	-		
	Remarques	-				Remarques	-		
	PTS 0	**PTD 0**	**PM 0**	**Sat 0**	**PO2 0**	**PTS i**	**PTD i**	**PM i**	**Sat i**
TVI	-	-	-	66	38	-	-	-	-
VCS			-	-	-			-	-
OD	-	-	11	-	-	-	-	13	-
VD bas	28	5	8	-	-	-	-	-	-
VD haut	-	-	-	-	-	-	-	-	-
APT	18	11	14	64	38	-	-	-	-
APD	-	-	-	-	-	-	-	-	-
APG	-	-	-	-	-	-	-	-	-
CAPSD	-	-	-	-	-	-	-	-	-
CAPID	-	-	-	-	-	-	-	-	-
CAPSG	-	-	-	-	-	-	-	-	-
CAPIG	-	-	-	-	-	-	-	-	-
OG	-	-	11	-	-	-	-	-	-
VPSD	-	-	-	-	-	-	-	-	-
VPID	-	-	-	-	-	-	-	-	-
VPSG	-	-	-	-	-	-	-	-	-
VPIG	-	-	-	99	132	-	-	-	-
VG	65	0	12	-	-	-	-	-	-
Ao asc	-	-	-	-	-	-	-	-	-
Ao th	61	41	49	87	60	62	44	51	-

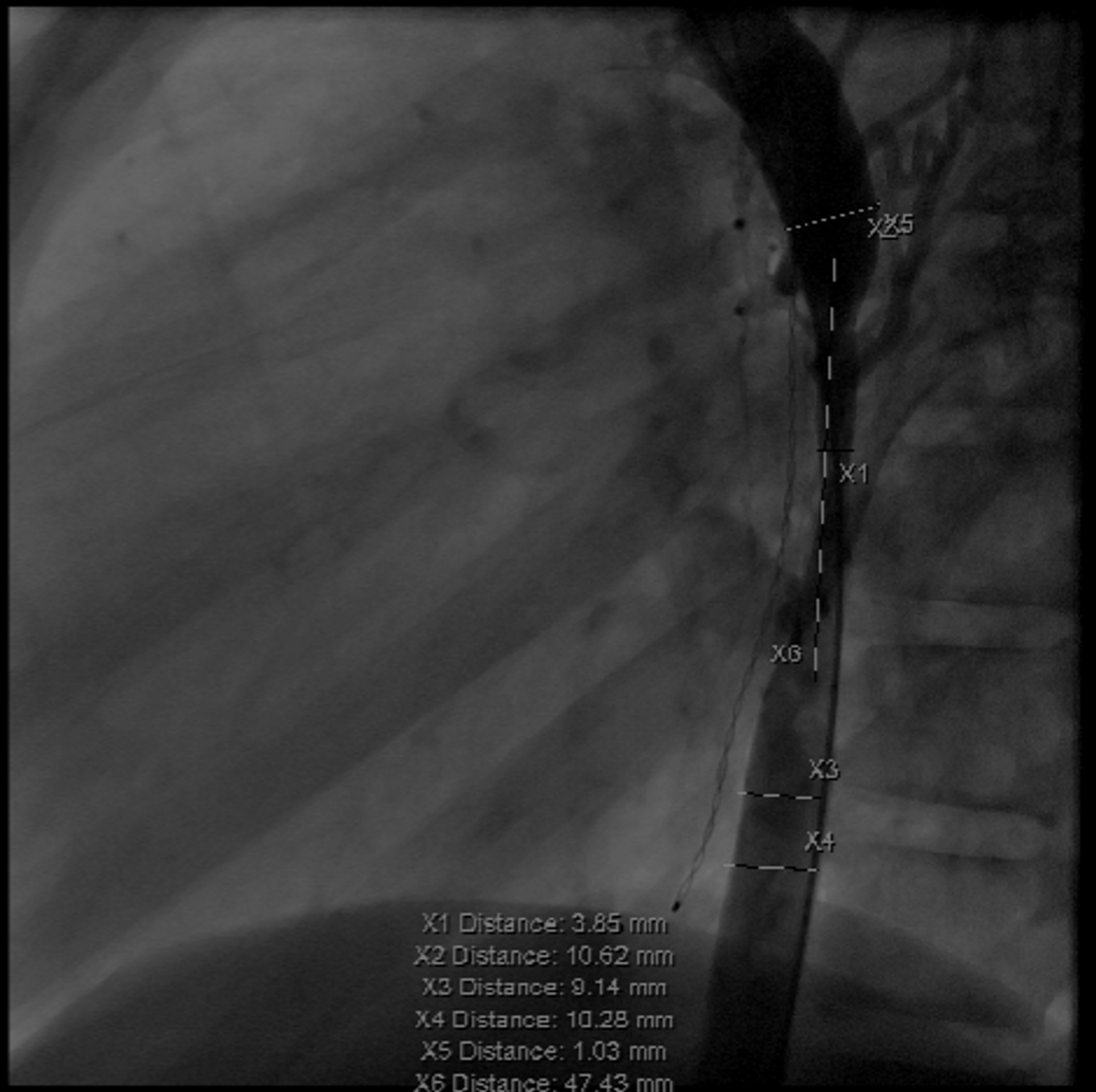
ASD closure

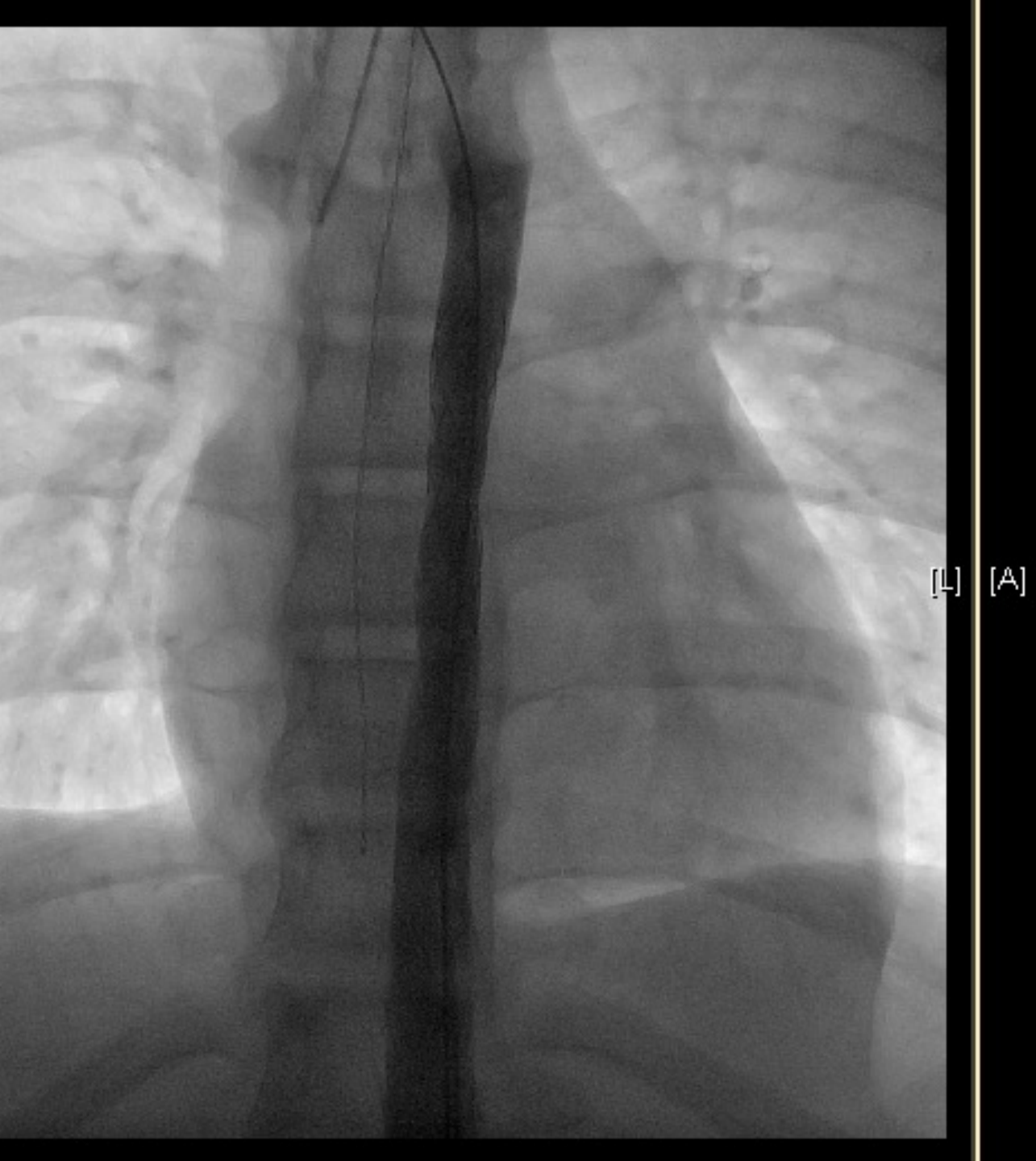
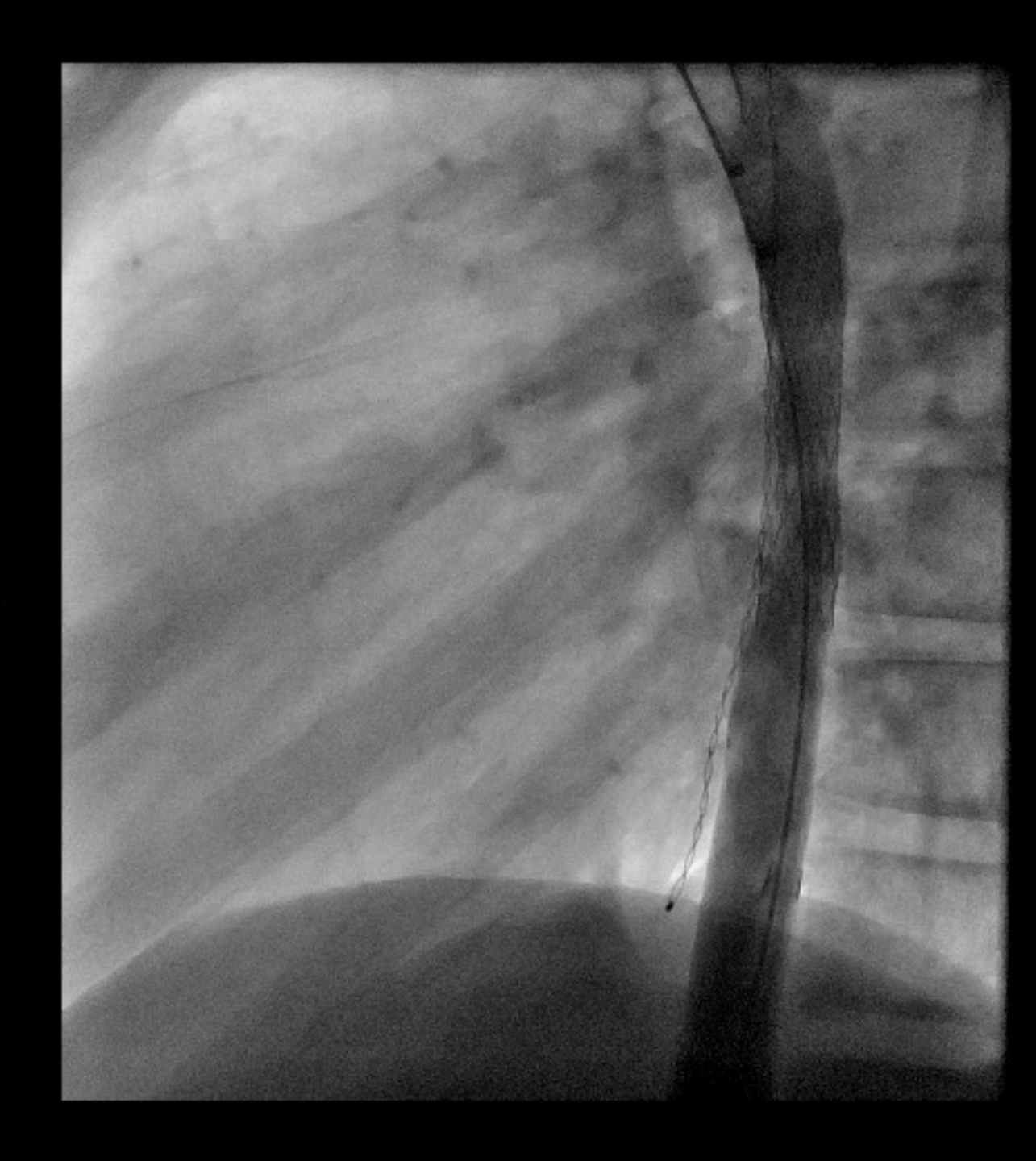


A very narrow aorta


X1
X3
X4
X2
X1 Distance: 11.94 mm
X2 Distance: 12.18 mm
X3 Distance: 3.97 mm
X4 Distance: 81.89 mm

[L] [A]


X5
X1
X6
X3
X4
X1 Distance: 3.85 mm
X2 Distance: 10.62 mm
X3 Distance: 9.14 mm
X4 Distance: 10.28 mm
X5 Distance: 1.03 mm
X6 Distance: 47.43 mm

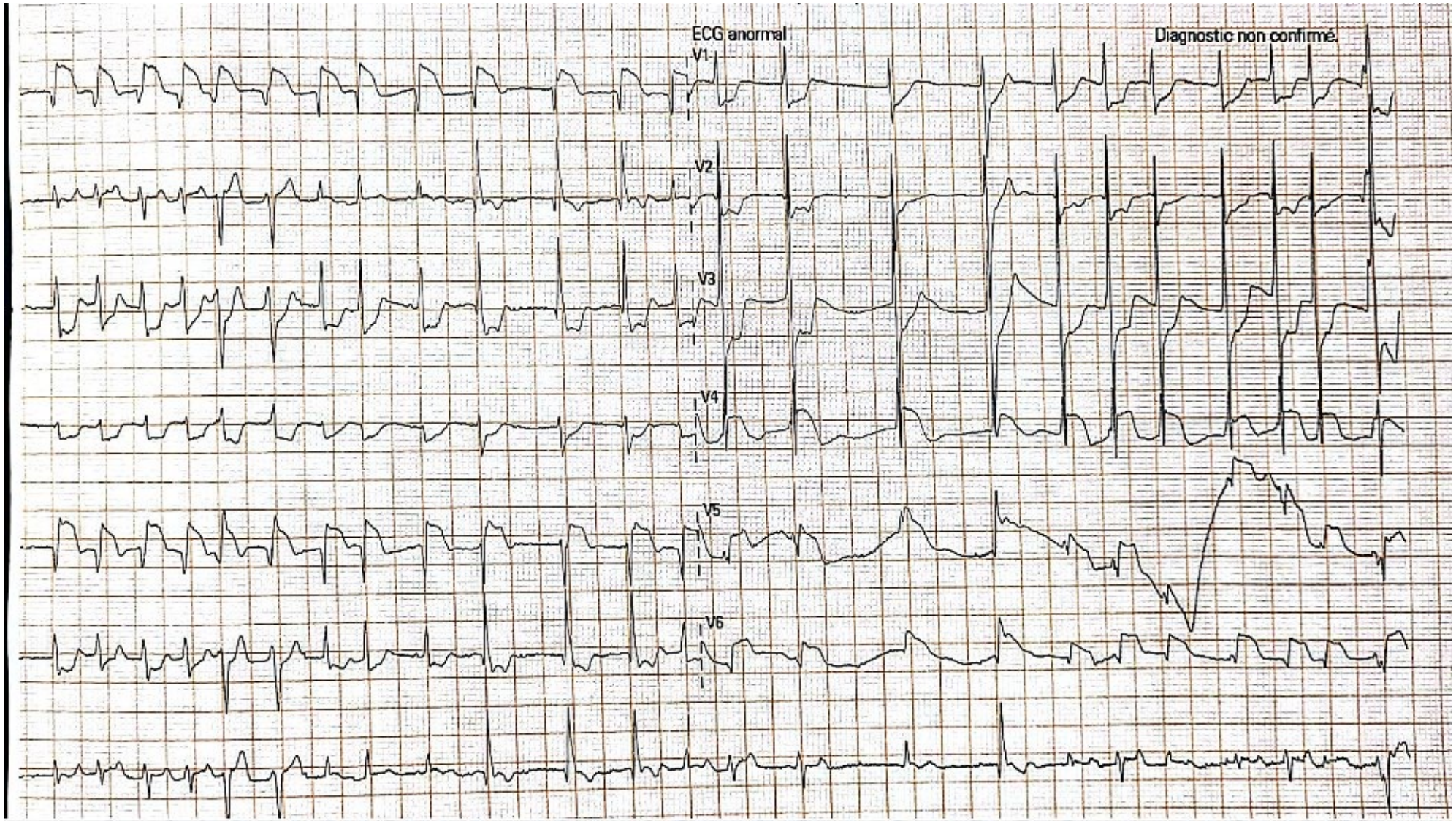

[L]

[A]

A very unusual case

Female term new-born (2.7kg)

- Uncomplicated pregnancy
- Urgent caesarean section for foetal bradycardia
- Normal Apgar-scores and umbilical artery pH

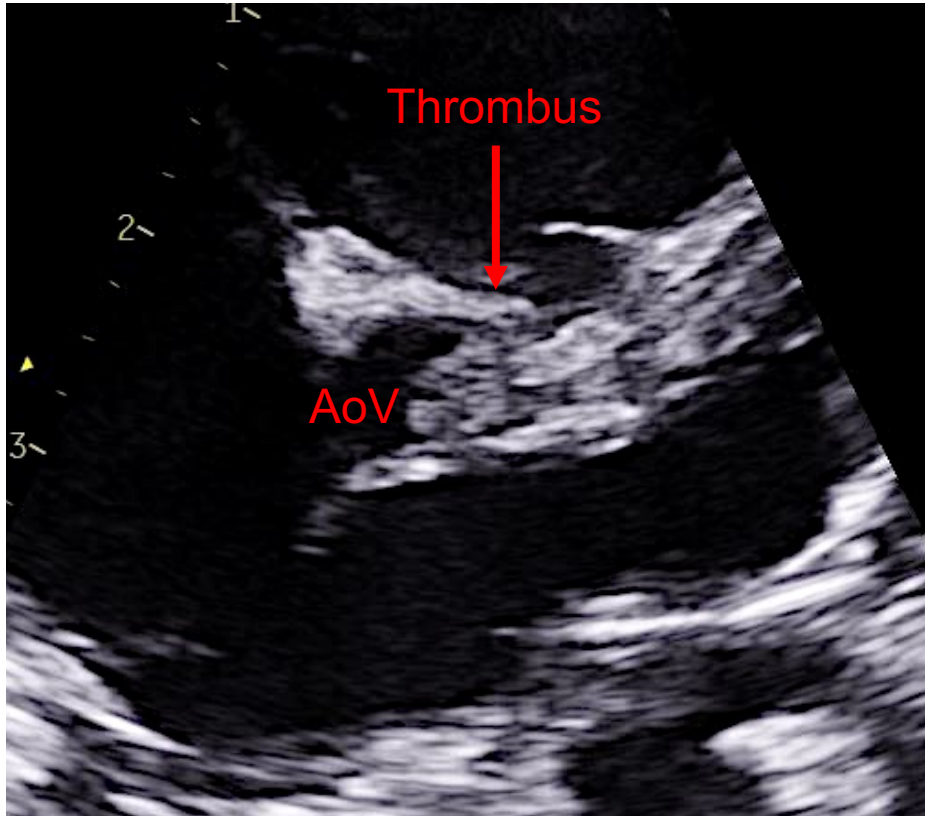
Severe cardiogenic shock at 4-hours of life


ECG anormal
Diagnostic non confirmé.
V1
V2
V3
V4
V5
V6

ECHOCARDIOGRAPHY

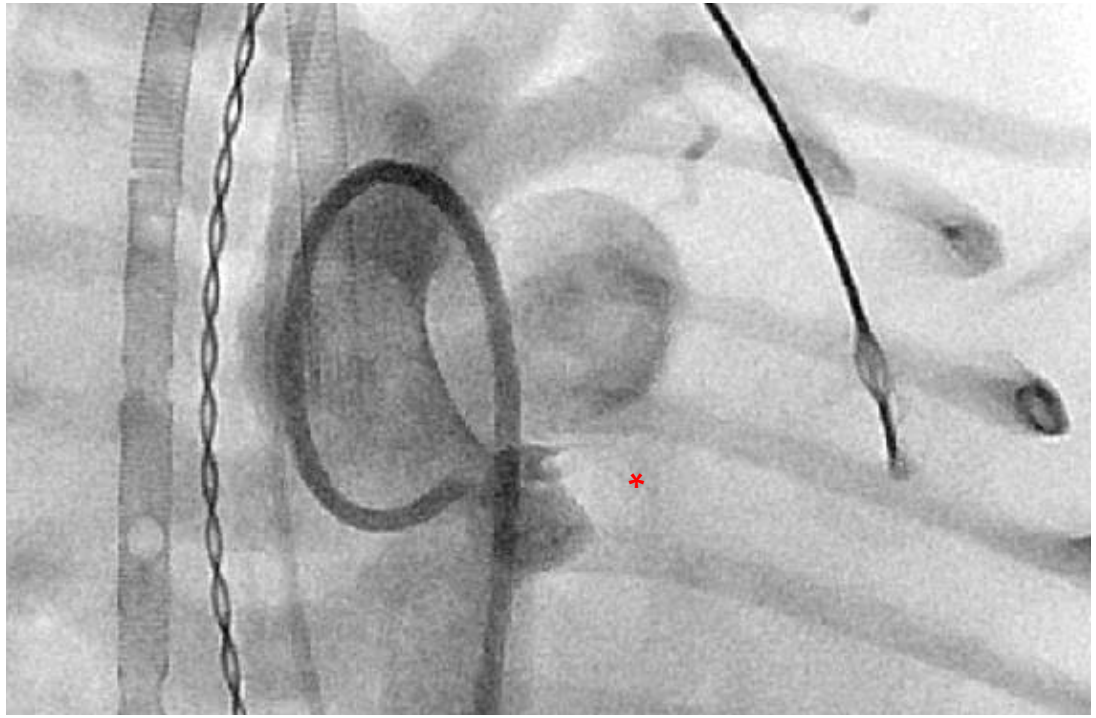
- Structurally normal heart
- Severe biventricular systolic dysfunction
- **Despite** persistent ductus arteriosus (PDA)
- Thrombotic structure at LMCA ostium

→ Placement of peripheral VA-ECMO in the cath lab



INTERVENTION

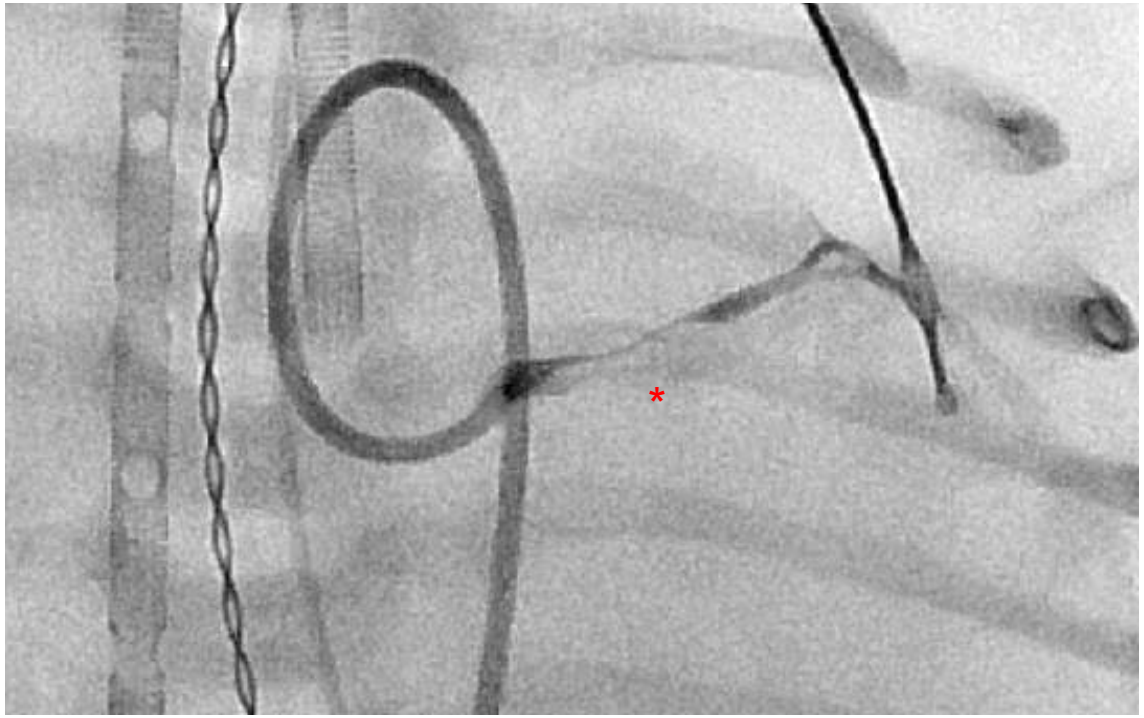
- Selective coronarography with a 4.2 JR catheter
- Complete thrombotic LMCA occlusion



INTERVENTION

- Intracoronary thrombolysis (Actilyse®, Altéplase 0.1mg/kg[1] over a few minutes)
- 0.014” HI-TORQUE PILOT™ guidewire followed by a PROGREAT® Microcatheter were advanced in the LMCA

→ Minimal left coronary flow was re-established



1. El-Sabrout H, Ganta S, Guyon P, Ratnayaka K, Vaughn G, Perry J, Kimball A, Ryan J, Thornburg CD, Tucker S, Mo J, Hegde S, Nigro J, El-Said H. Neonatal Myocardial Infarction: A Proposed Algorithm for Coronary Arterial Thrombus Management. Circ Cardiovasc Interv. 2022 May;15(5):e011664. doi: 10.1161/CIRCINTERVENTIONS.121.011664. Epub 2022 Apr 29. PMID: 35485231.

INTERVENTION

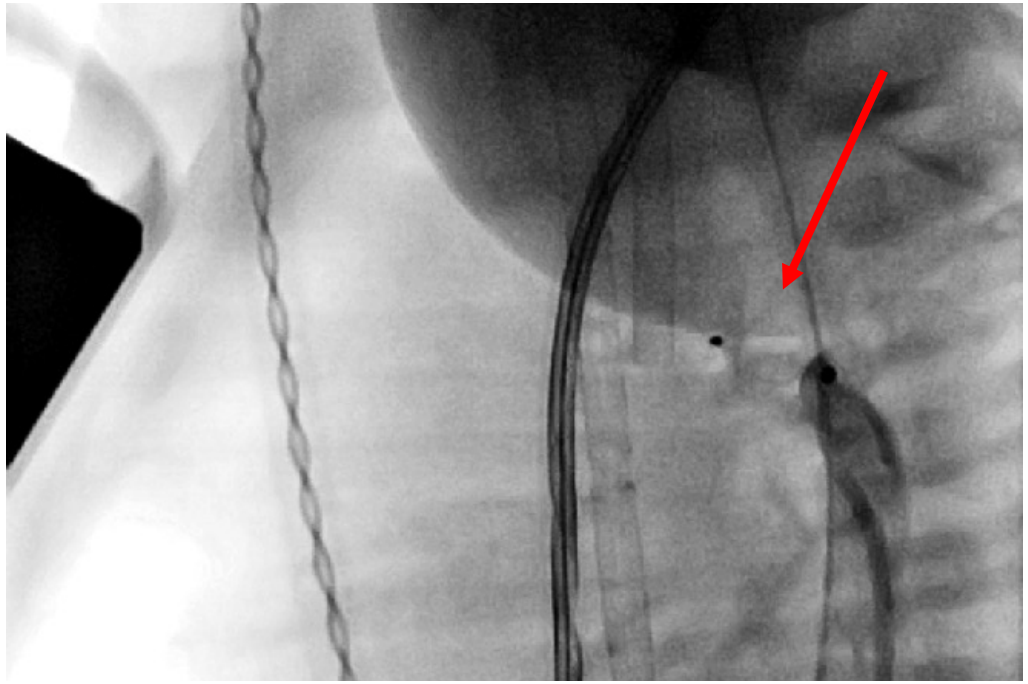
- After subsequent intracoronary thrombolysis, LCA flow was restored

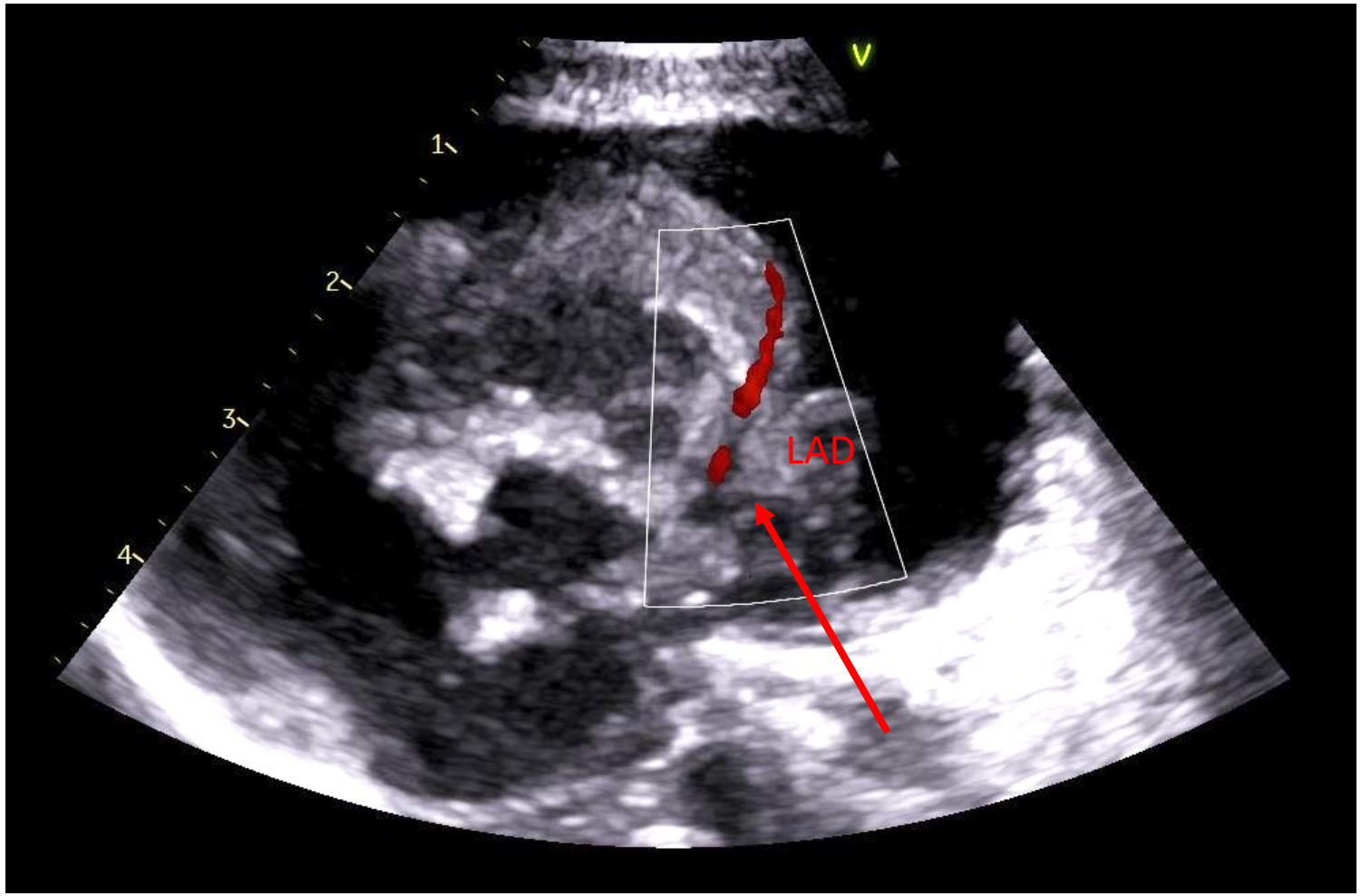
- Residual peripheral thrombus in the mid LAD

INTERVENTION II

- Insufficient systemic perfusion on VA-ECMO due to recirculation via PDA

- 12-h later transcatheter retrograde PDA-closure with an Amplatzer™ Duct Occluder II (5x4mm)




V
1
2
3
4
LAD

WHAT NEXT?

- Troponin-T levels gradually dropped from 220’000ng/L to 700ng/L
- Echo demonstrated steady improvement in LV function with patent LMCA/LAD under Adrenalin, Levosimendan, and VA-ECMO support
- BUT unsuccessful VA-ECMO weaning after 3-weeks
- Autoptic findings showed pervious coronary arteries

CONCLUSIONS

- Acute myocardial infarction in structurally normal heart is a very rare cause of neonatal cardiogenic shock
- It has a high mortality rate
- In this case, paradoxical embolization from the placenta was postulated due to perinatal manifestation in absence of other risk-factors
- After stabilisation on VA-ECMO, early intracoronary thrombolysis should be considered as rescue strategy