



# Complicaciones mecánicas del infarto

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# Índice



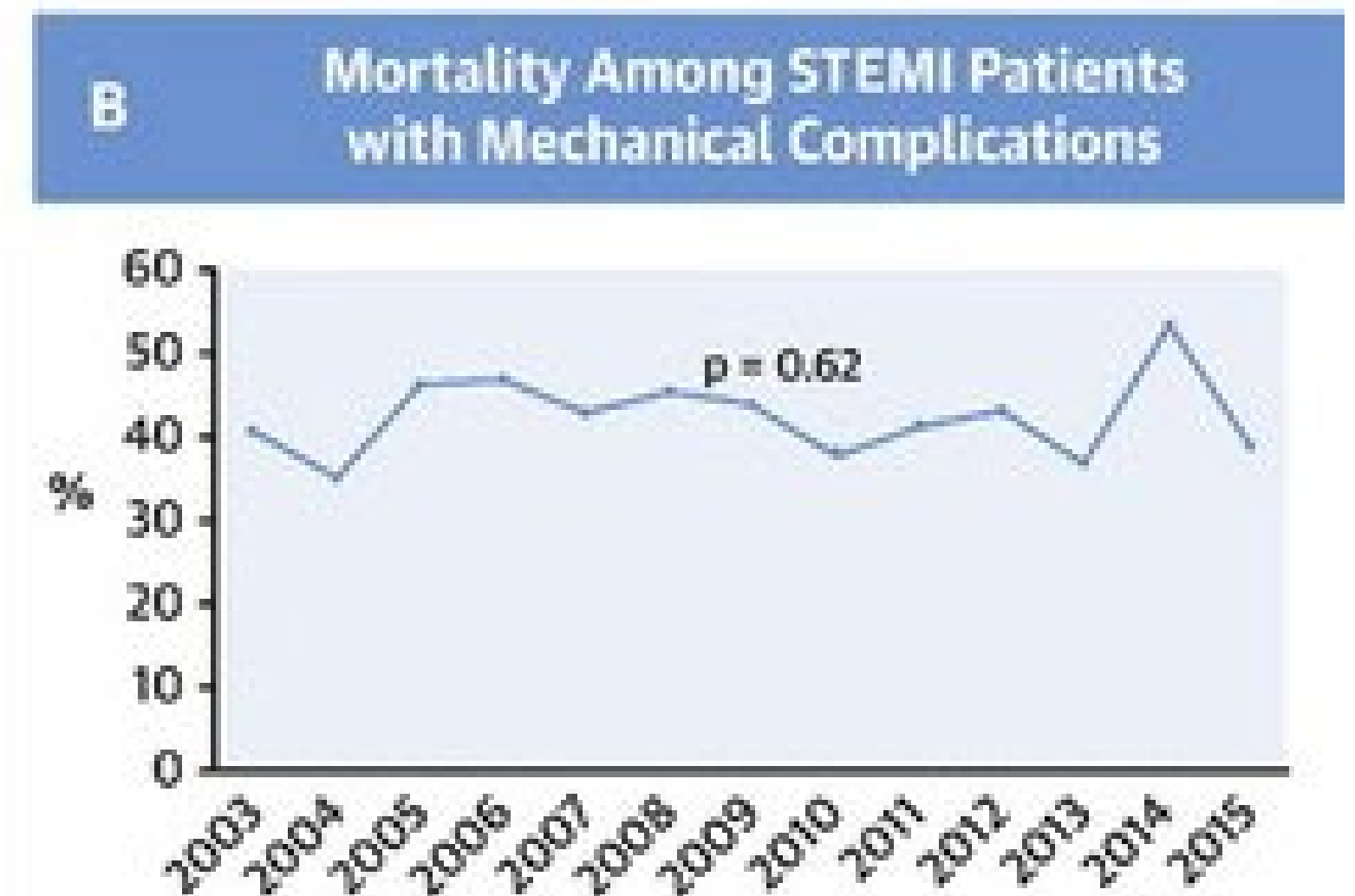
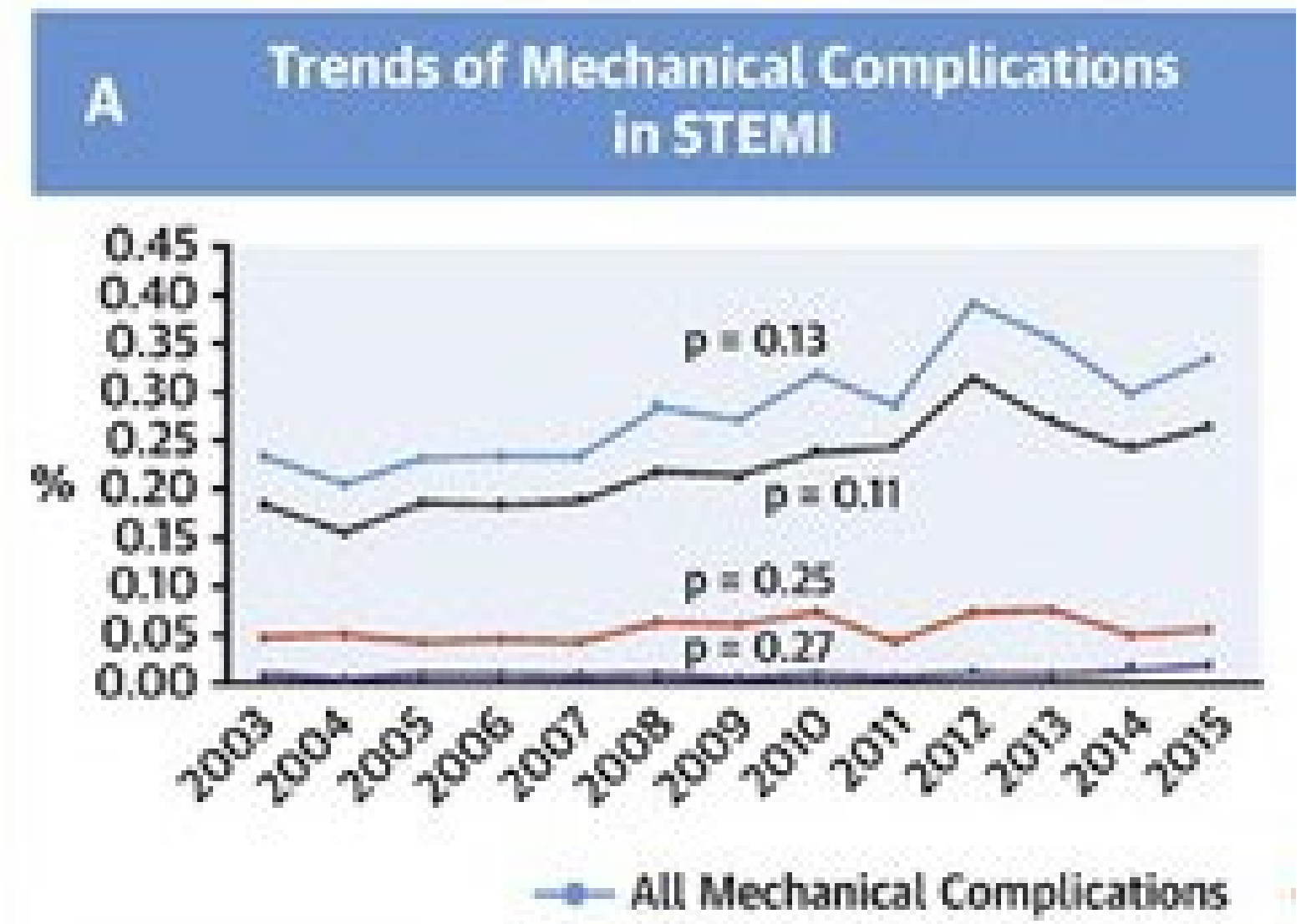
- EPIDEMIOLOGÍA Y RELEVANCIA
- ROTURA DE PARED LIBRE
- ROTURA DEL SEPTO INTERVENTRICULAR
- ROTURA DE MÚSCULO PAPILAR

# Epidemiología

“Rotura espontánea del miocardio después de un infarto.”

3.951.861 hospitalizaciones por IAM

IAMCEST: 0,27% (mortalidad 42,4%)



# Epidemiología

Edad > 75 años

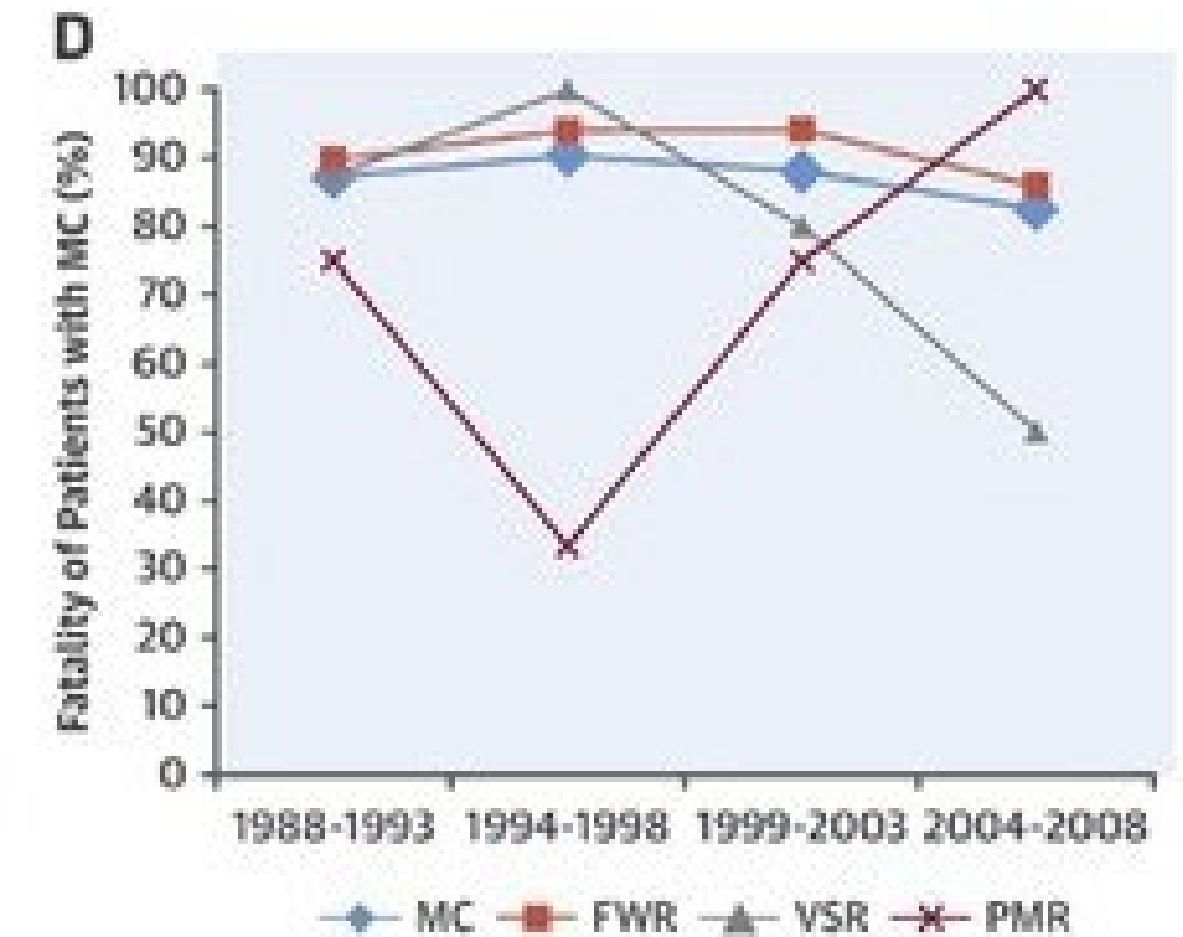
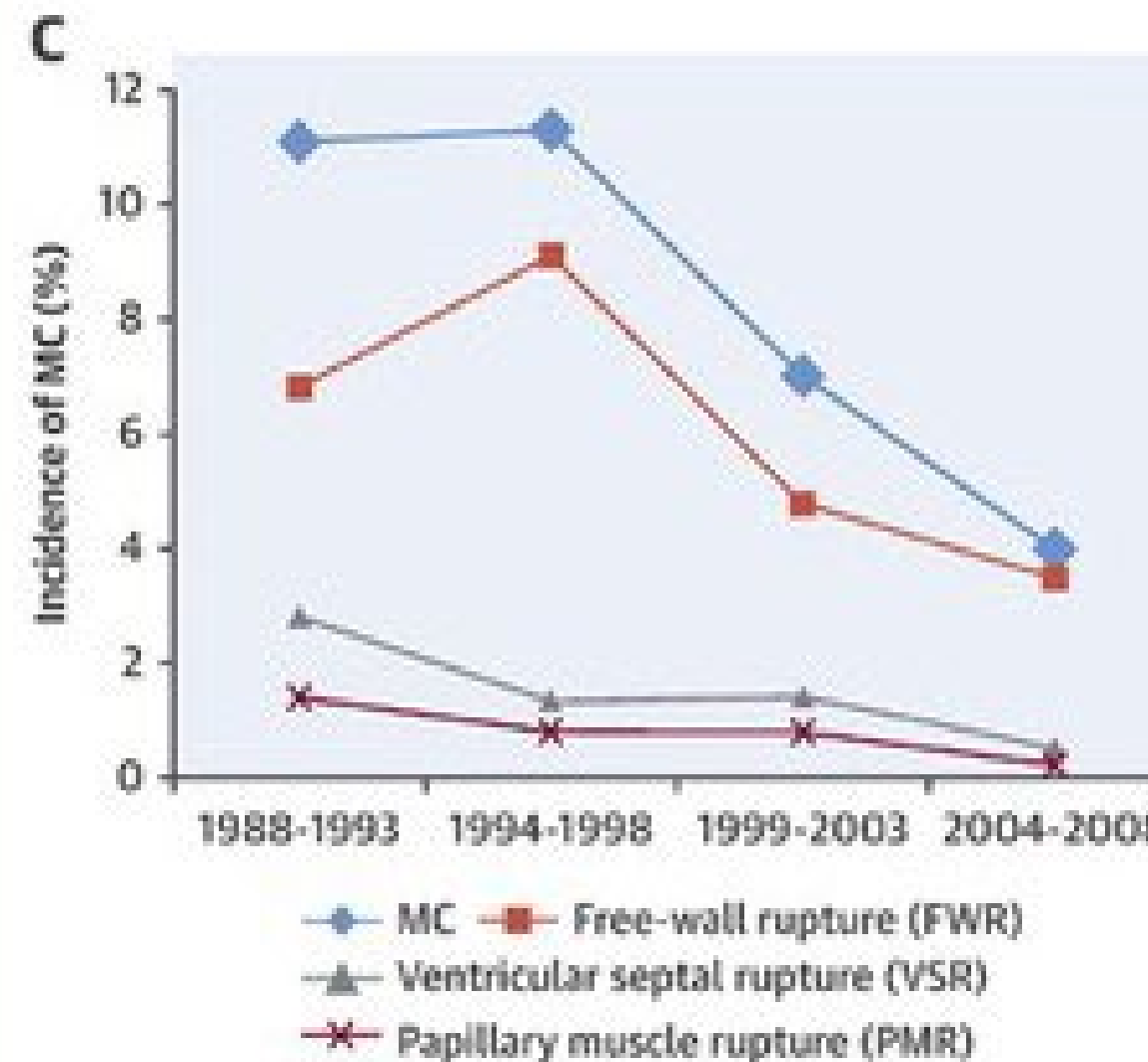
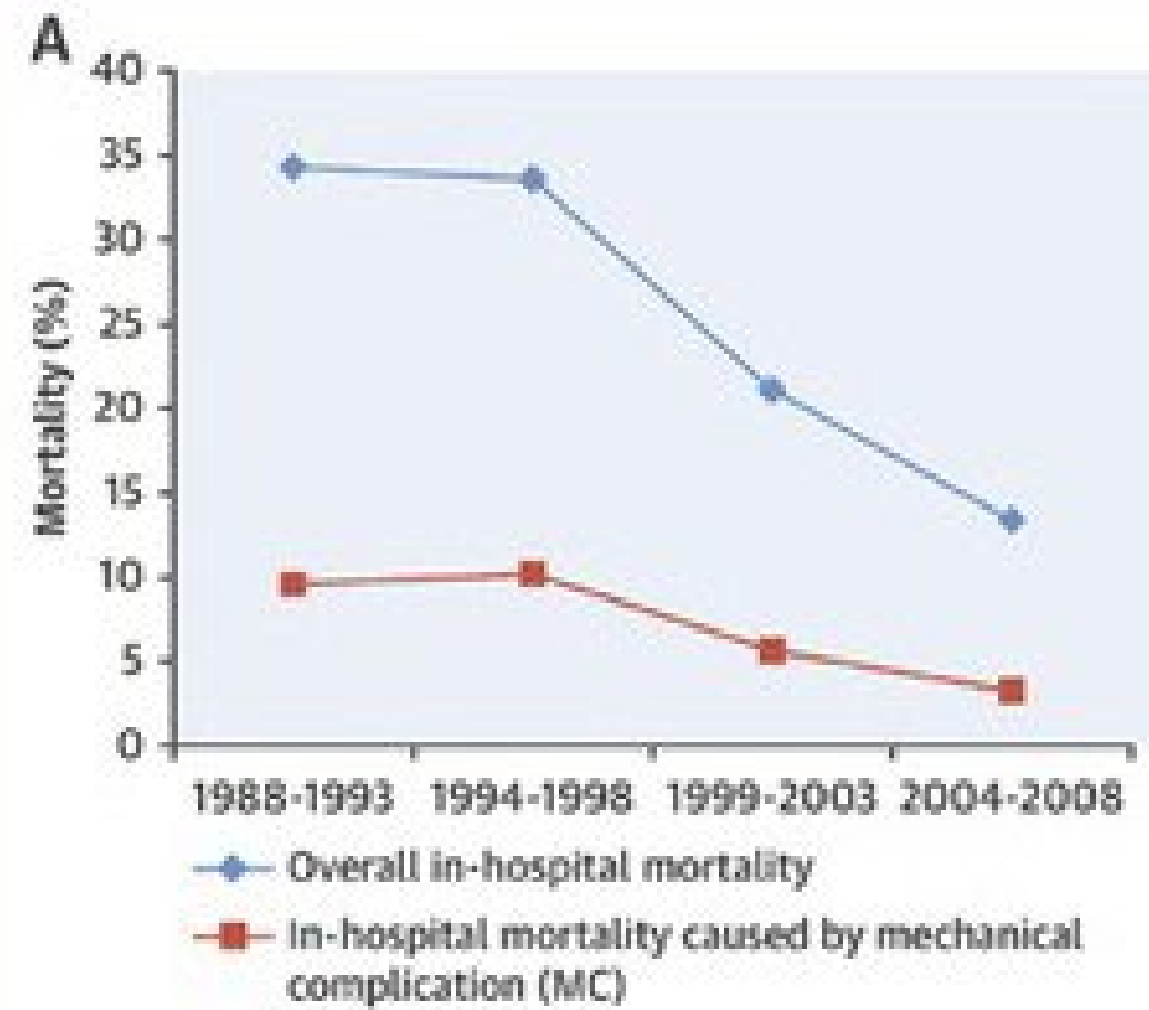
Complicaciones mecánicas: 8,2%  
(11,1% > 4,3%)

Rotura pared libre: 5,9%

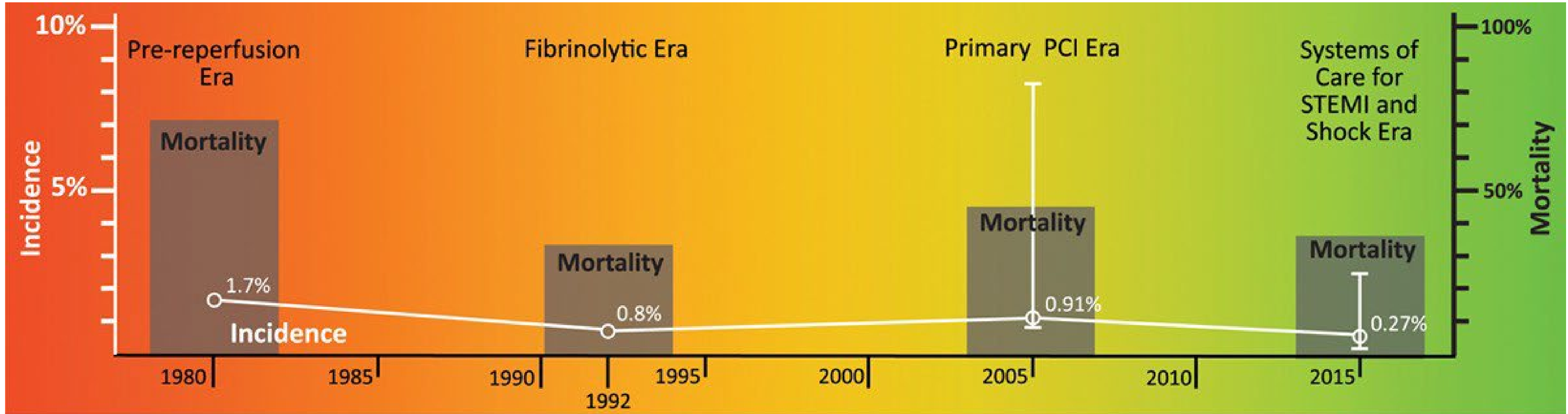
Rotura septo interventricular: 1,4%

Rotura músculo papilar: 0,8%

Supervivencia: 12,9% > 17,6%



# Epidemiología



\*Data taken from a sampling of reported incidences from various reports

# Epidemiología

- Pacientes mayores
- Mujeres
- Enfermedad renal crónica
- Hipertensión arterial
- Primer infarto de miocardio



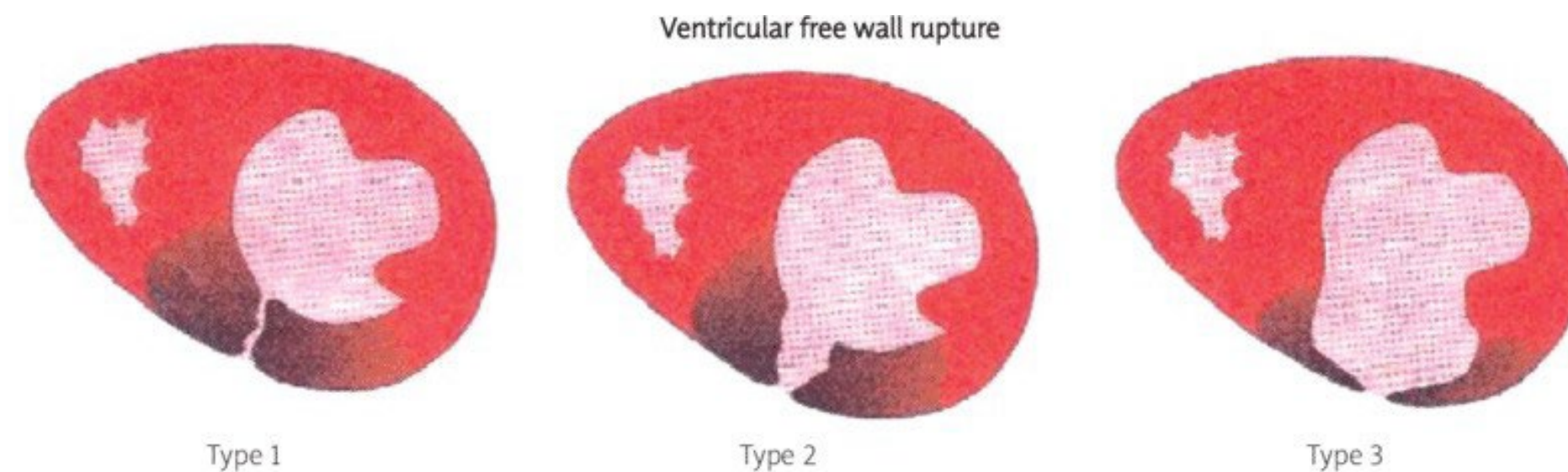
# Rotura de pared libre

- Mortalidad > 50% | Tras cirugía > 35%
- Infraestimado por mortalidad prehospitalaria
- Aguda: shock o disociación electromecánica. Subaguda
- Clasificación de Becker

Tipo I: < 24 horas. Abrupto, hendidura

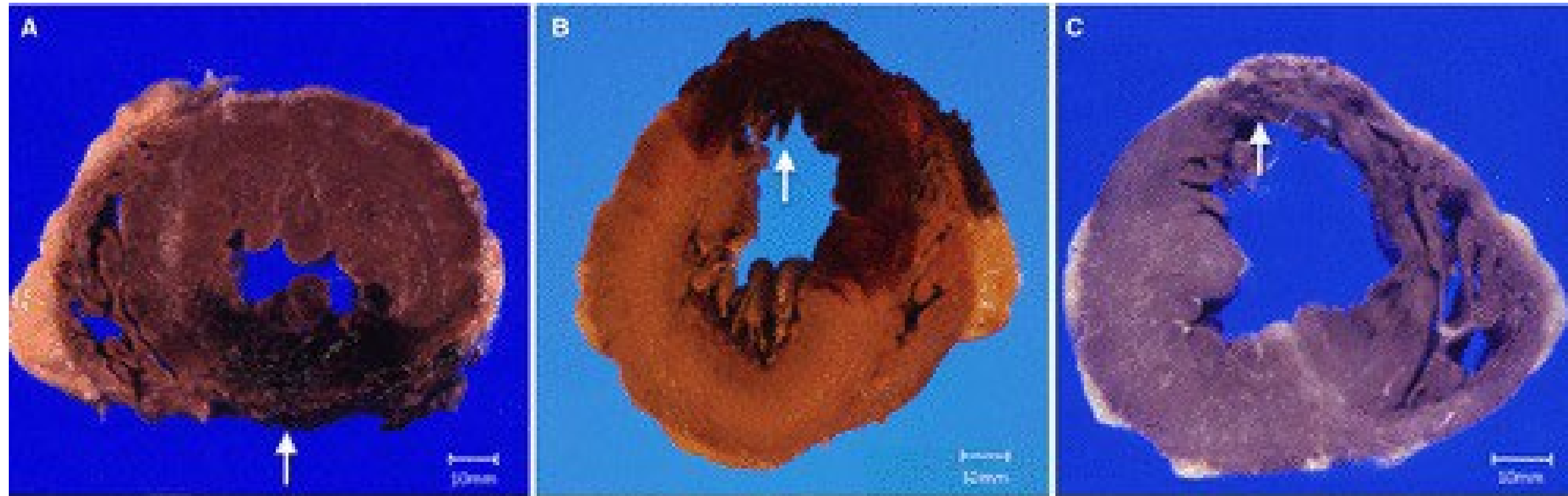
Tipo II: erosión miocárdica, desgarramiento progresivo

Tipo III: > 7 días. Adelgazamiento miocardio, perforación aneurisma



# 63 necropsias en rotura de pared libre

## Incidence of myocardial hemorrhage



69-year-old, female

Type 1 rupture

Myocardial Hemorrhage (+)

Treated with fibrinolysis

68-year-old, man

Type 2 rupture

Myocardial Hemorrhage (+)

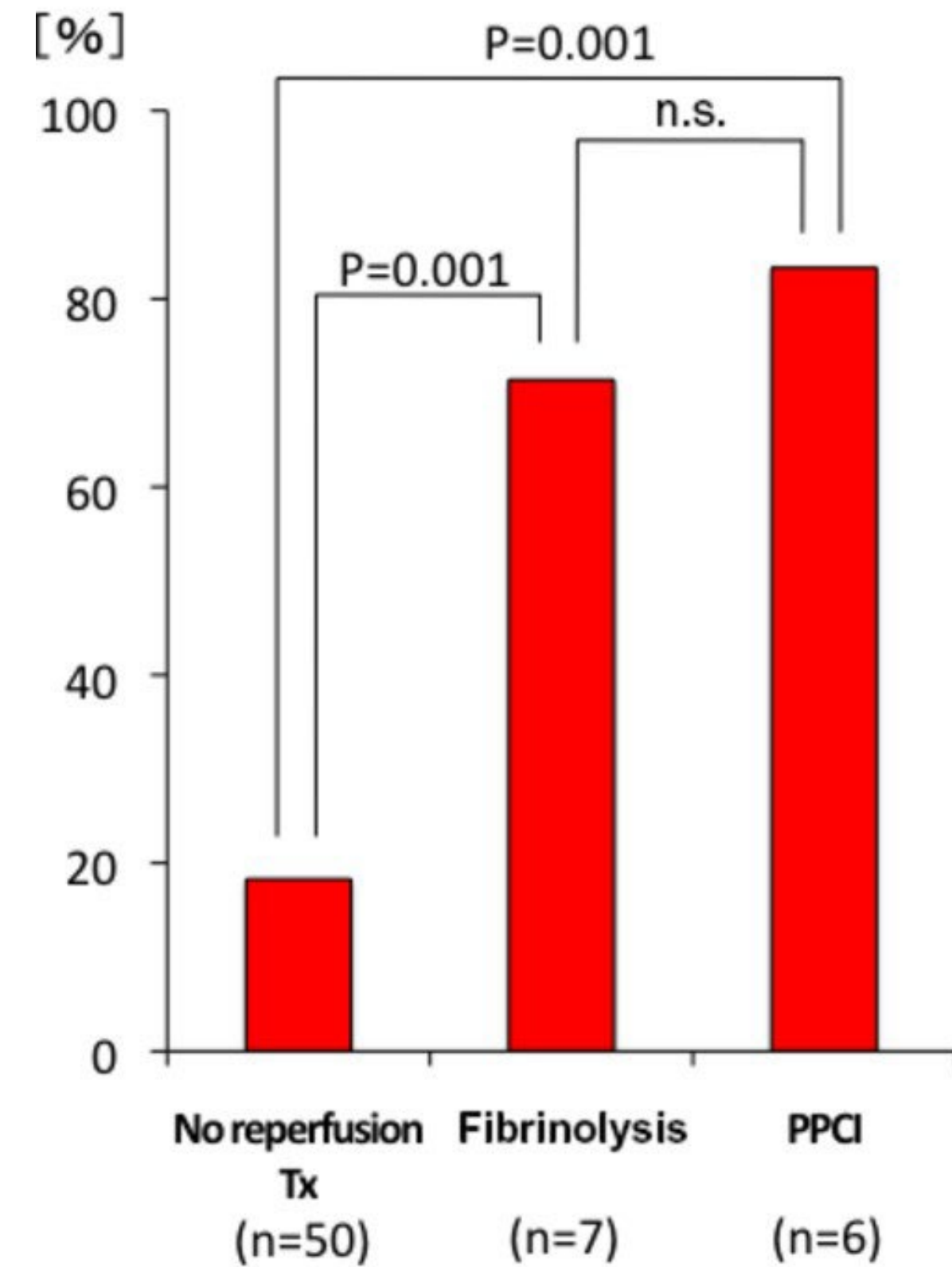
Treated with PPCI

87-year-old, female

Type 3 rupture

Myocardial Hemorrhage (-)

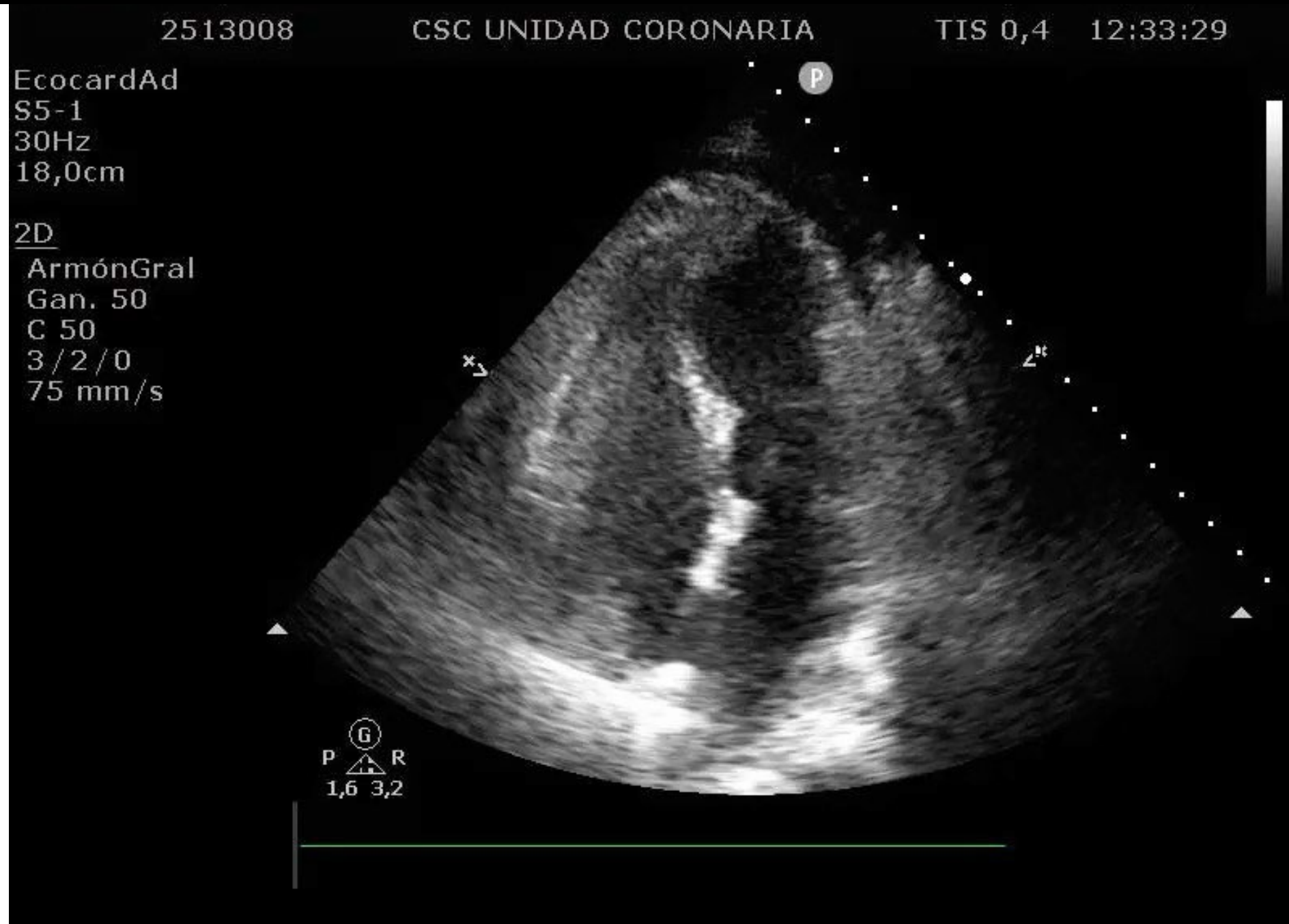
No reperfusion therapy



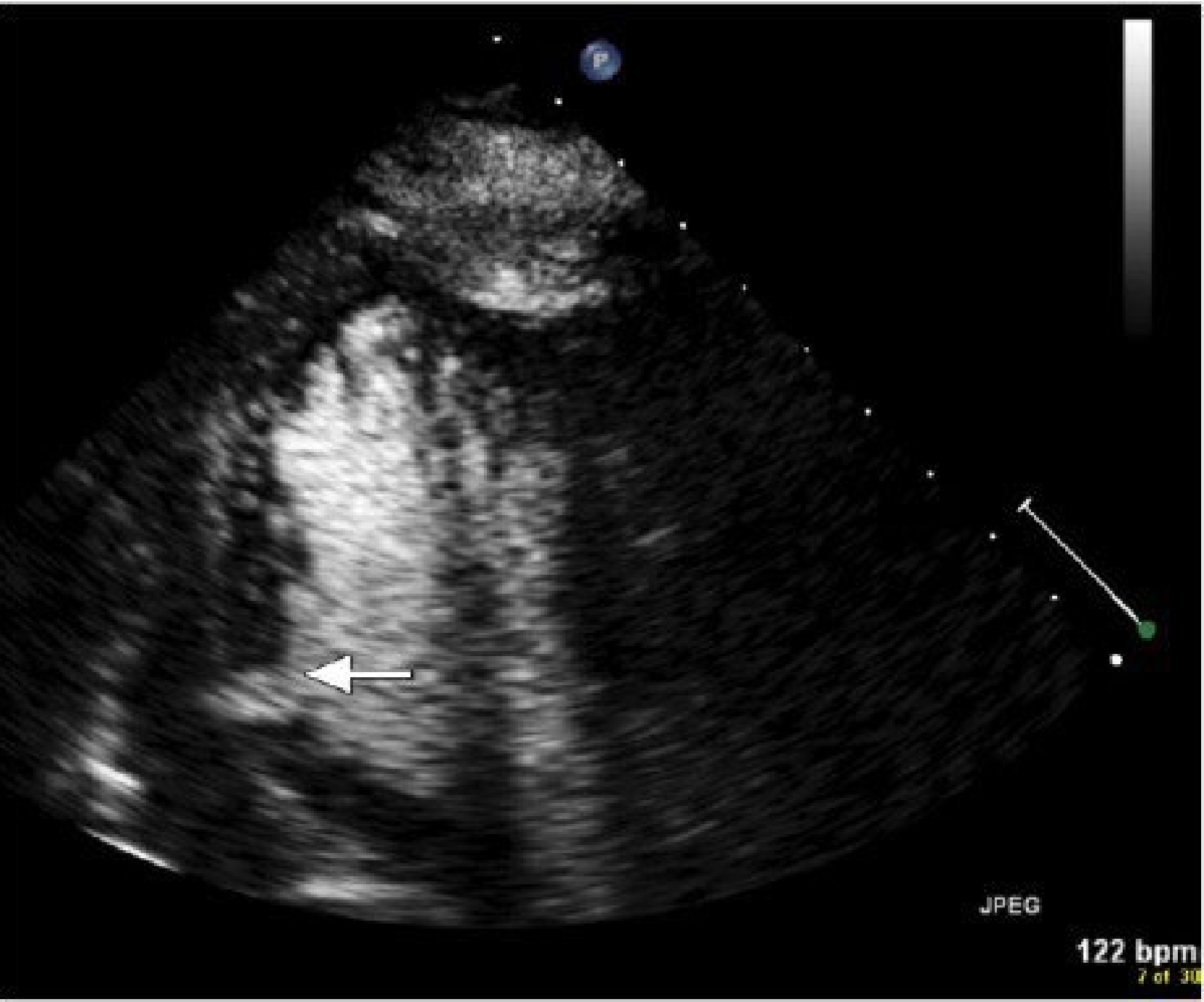
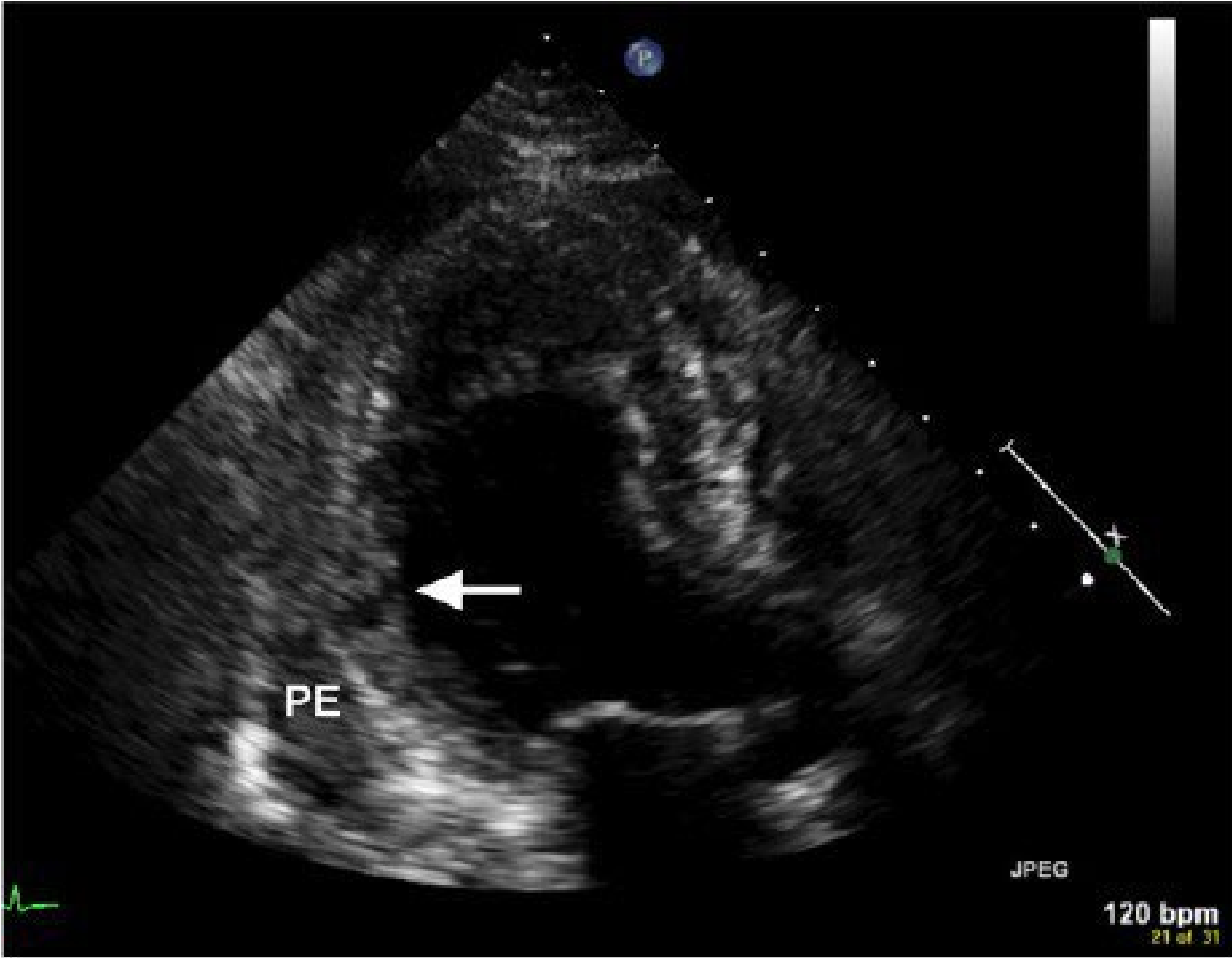
Hemorragia miocárdica: daño por isquemia-reperfusión



# Diagnóstico: Ecocardiograma



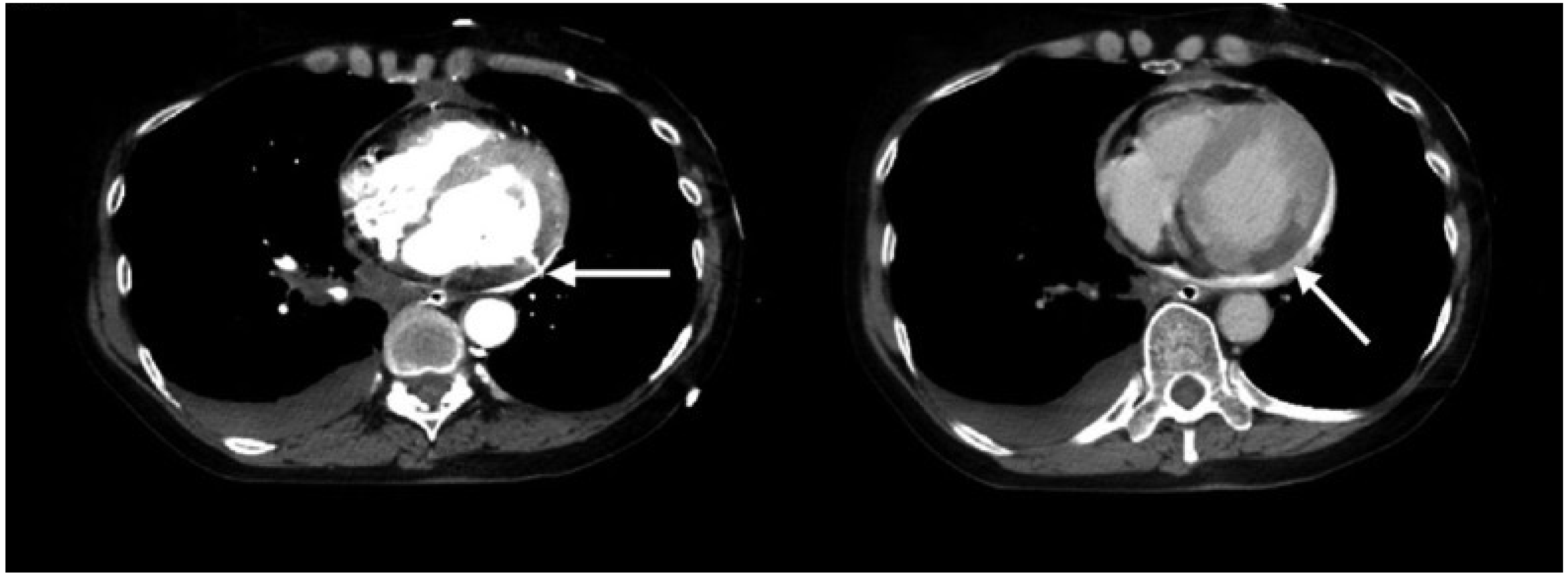
# Ecocardiograma



# Angiografía



TC



# Tratamiento

¿Pericardiocentesis?

Cirugía: reparación con  
parche (pegamento) / sutura

ECMO: compromiso del retorno venoso  
por taponamiento

Alternativa: inyección intrapericárdica  
percutánea de fibrina

# Ruptura del septo interventricular

- Mortalidad 80% sin cirugía
- Más frecuente a los 3-5 días del infarto
- Anterior (70%): defecto simple. Inferior (30%): defecto complejo

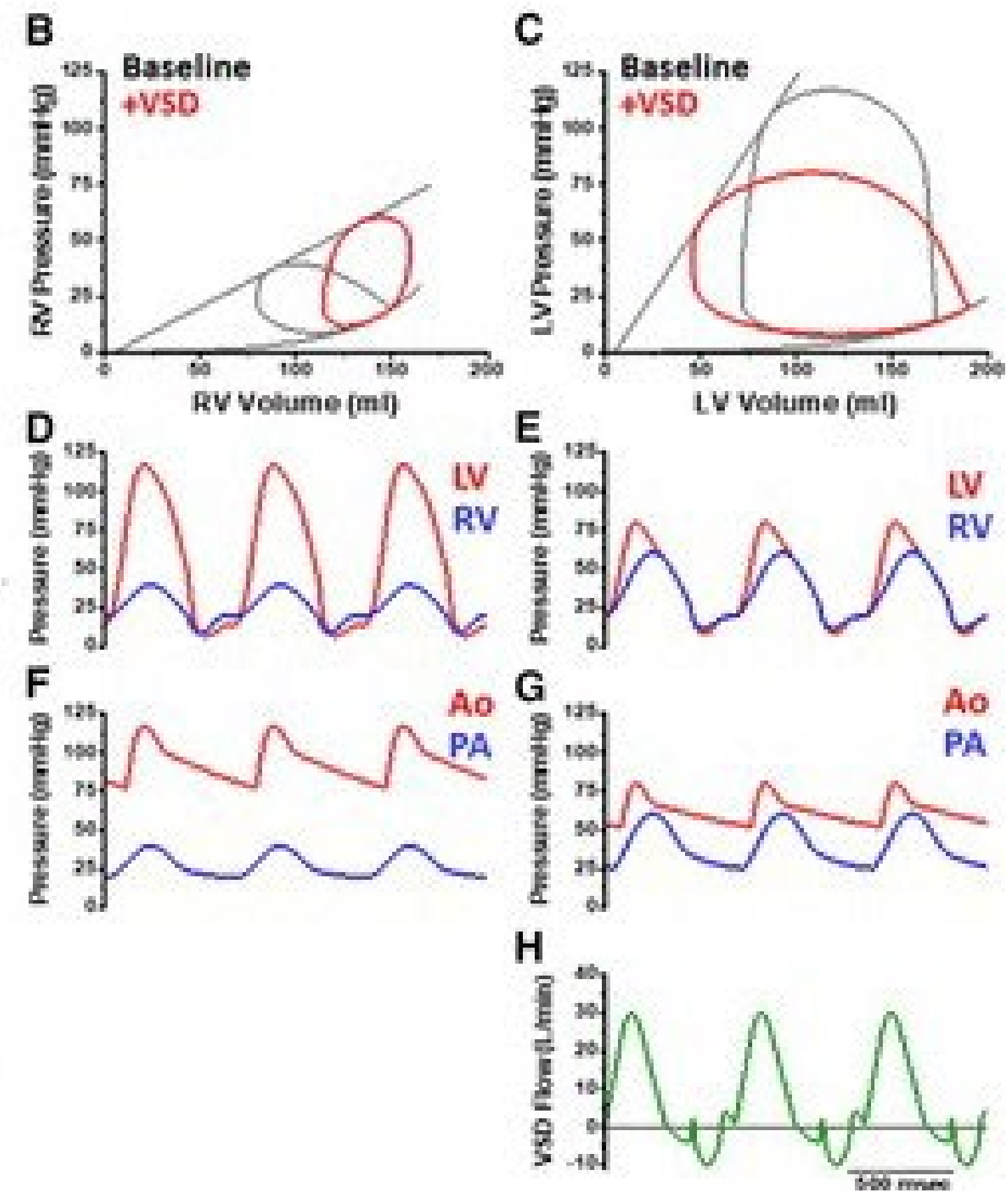
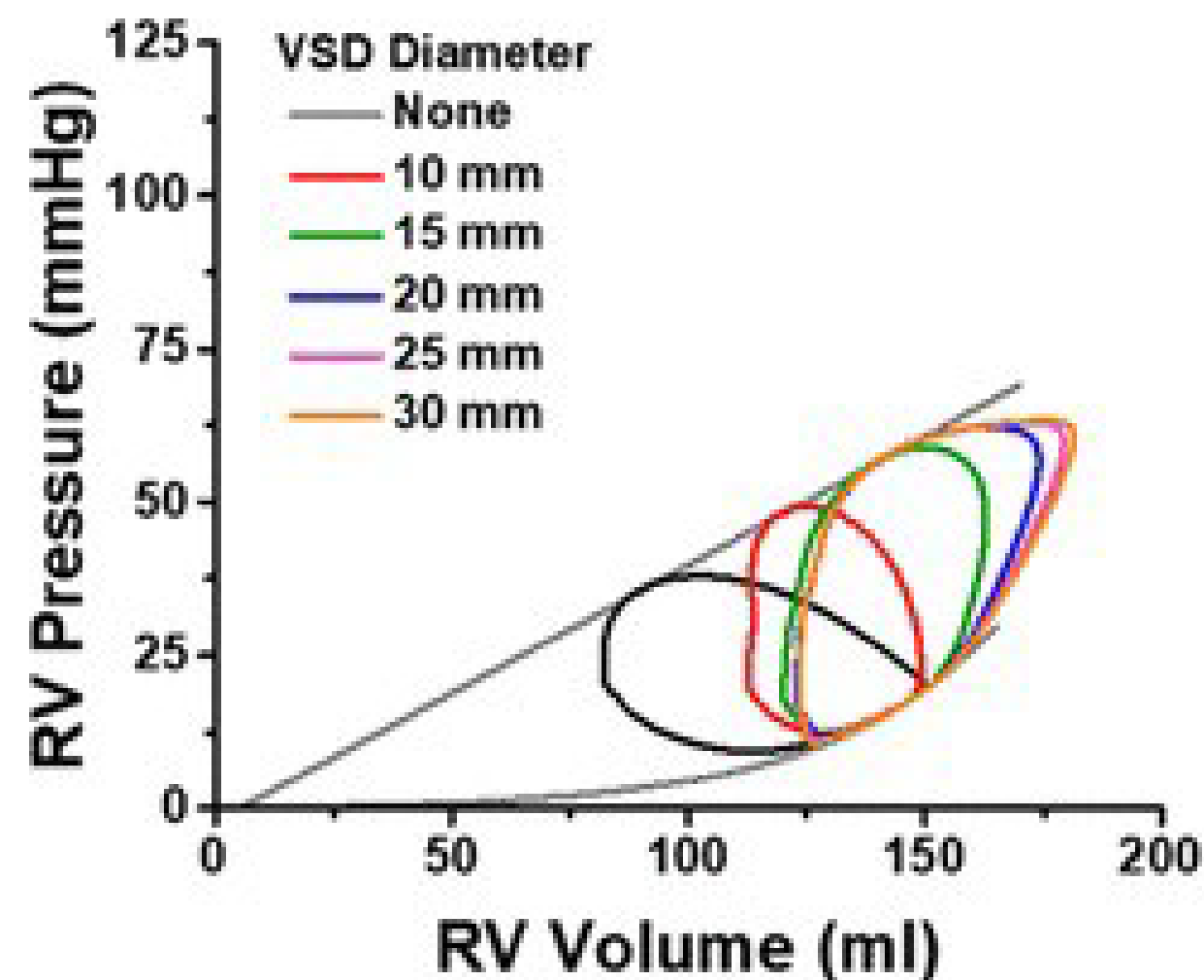
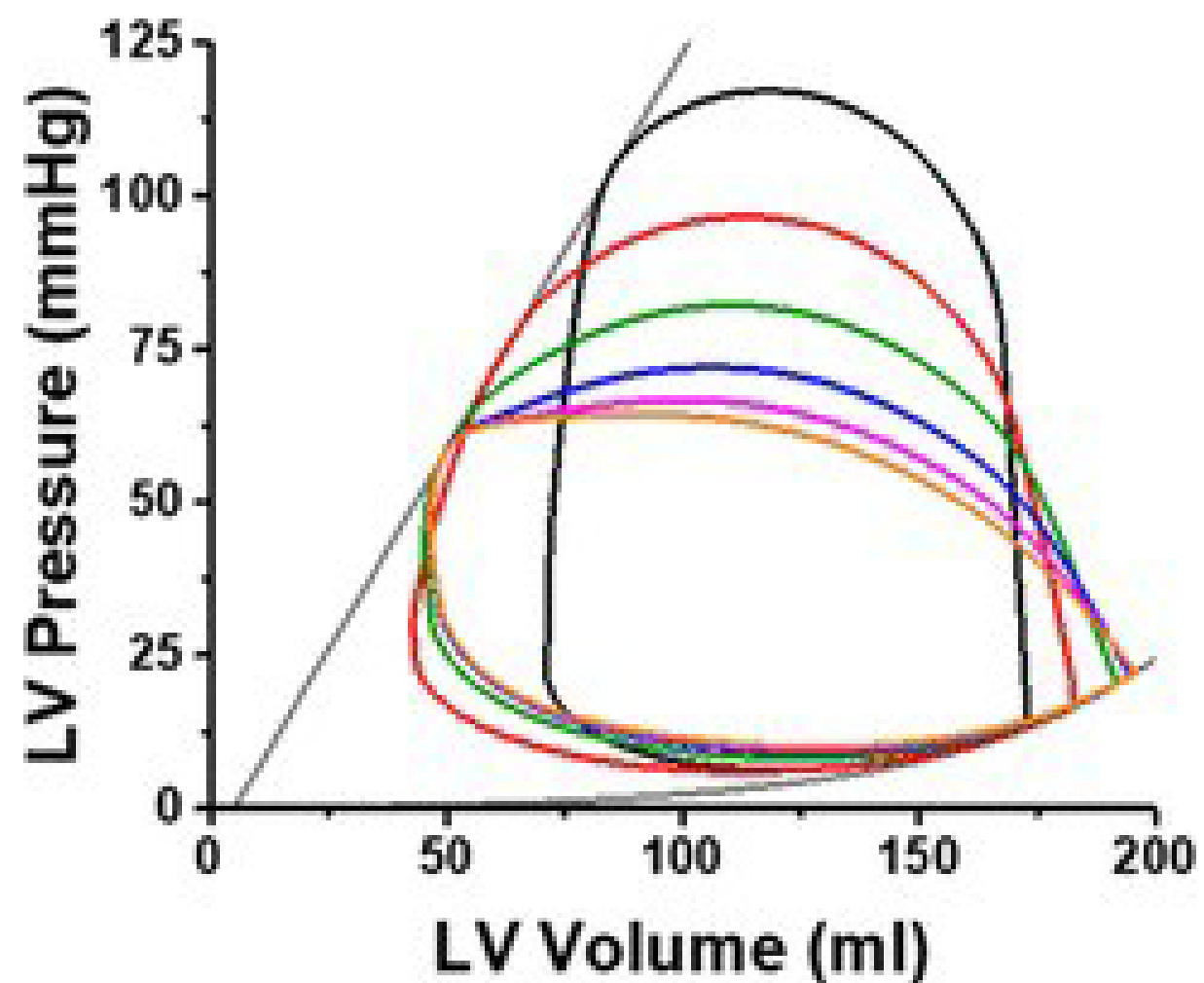
**Table 7.** Patient Characteristics: VSR vs. Acute Severe MR in SHOCK Trial Registry Patients

Characteristic	VSR*	Severe MR*	p Value
n	54	97	
Mean age (yrs)	71.7 ± 10.0	69.8 ± 10.1	0.253
Female	57.4%	51.6%	0.502
History of hypertension	51.0%	59.0%	0.385
History of MI	15.1%	33.0%	0.020
Diabetes	17.0%	33.7%	0.035
Smoking	35.6%	46.0%	0.271
Anterior MI	49.0%	34.5%	0.106
Median MI to CS (hours)	15.8	13.2	0.601
Heart rate (beats/min)	101.6 ± 22.3 (49)	97.1 ± 24.1 (94)	0.246
Pulmonary capillary wedge pressure (mm Hg)	22.3 ± 8.5 (42)	22.1 ± 7.5 (76)	0.839
Right atrial pressure (mm Hg)	18.0 ± 7.2 (25)	14.1 ± 12.5 (42)	0.002
LV ejection fraction (%)†	40.6 ± 11.0 (17)	38.7 ± 17.2 (58)	0.281
In-hospital survival	13.0%	45.4%	< 0.001



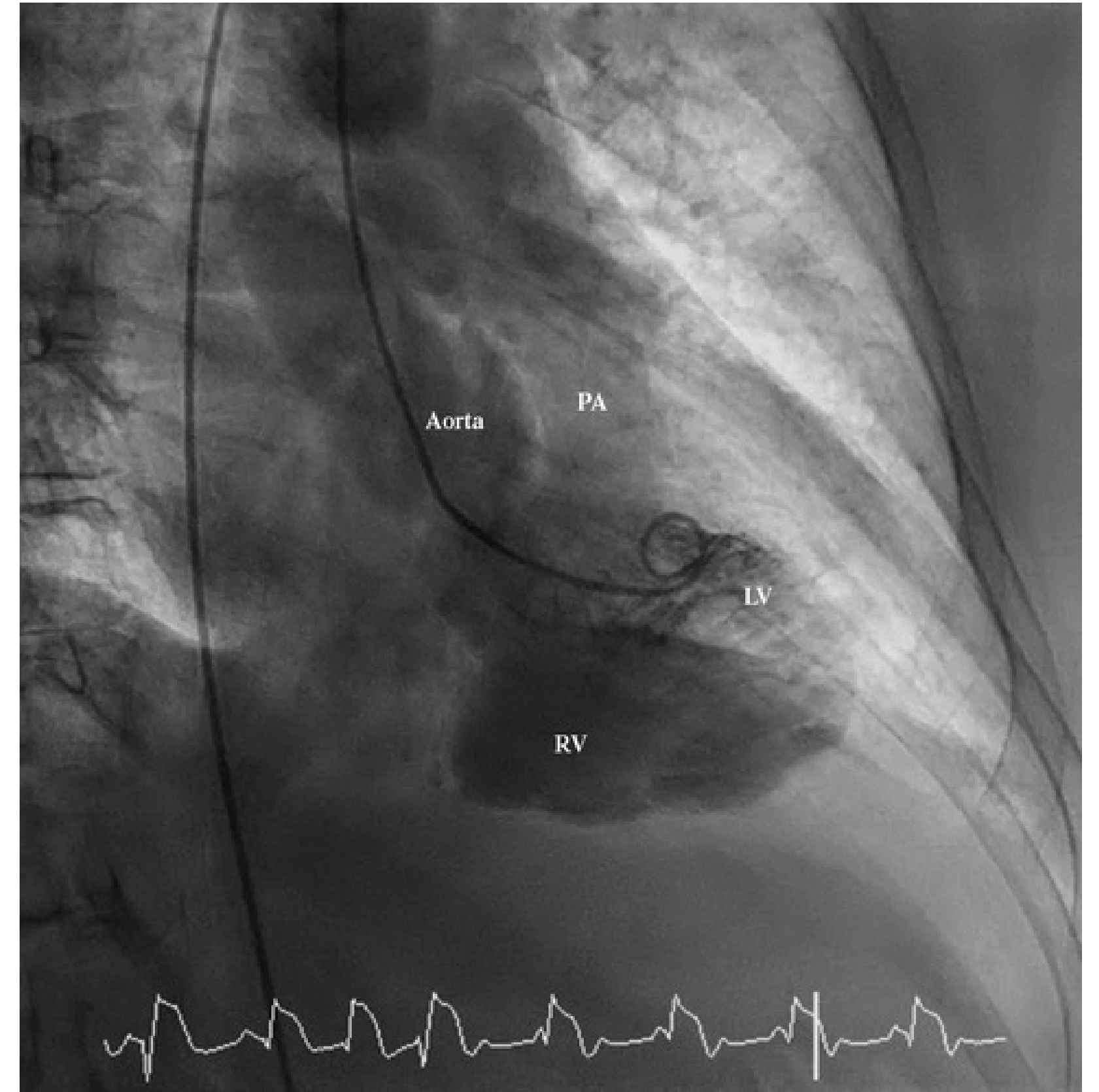
# Simulación Curvas presión-volumen

VSD 16 mm, Qp/Qs 3:1

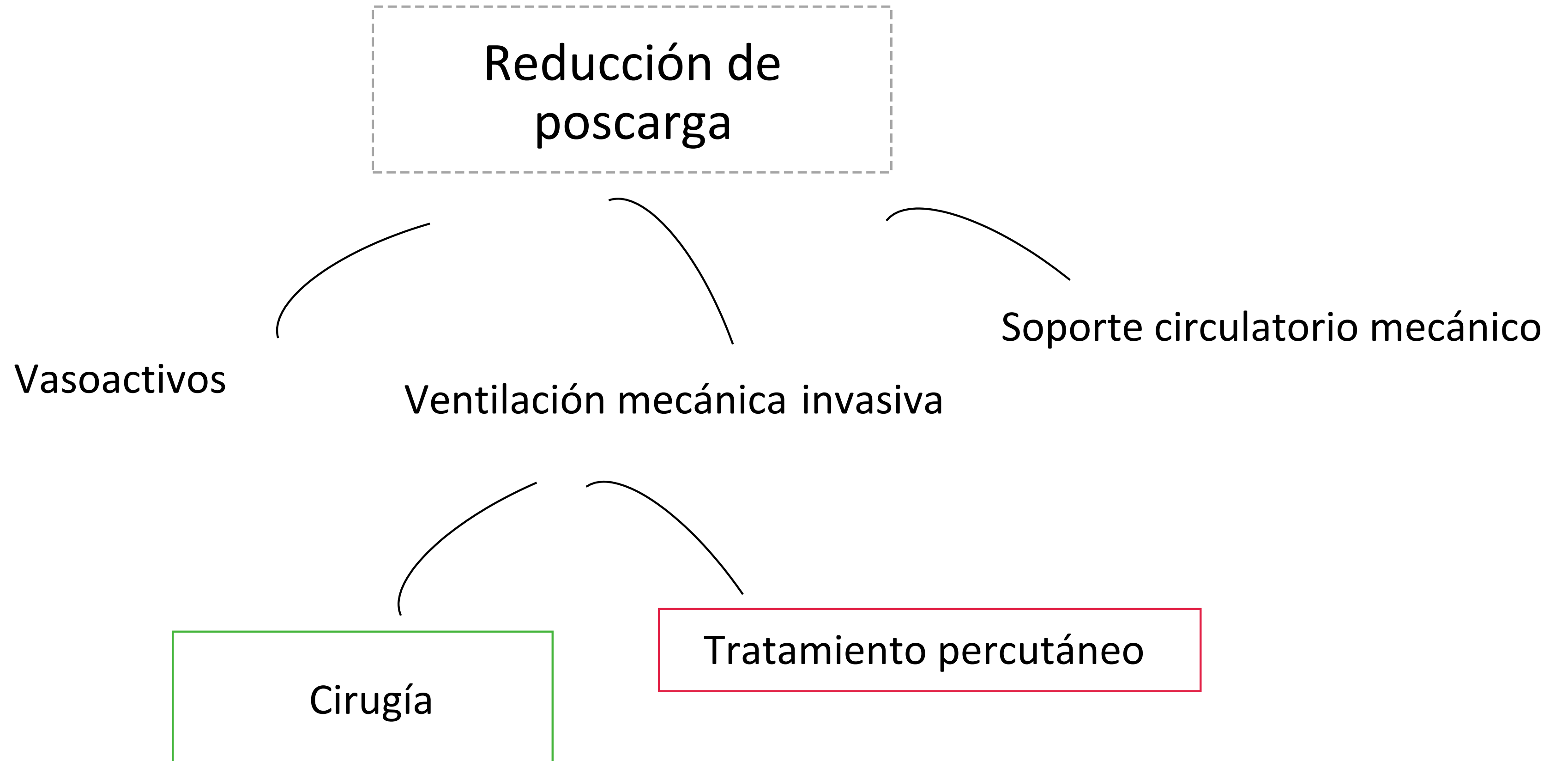


# Diagnóstico: cateterismo derecho y ventriculografía

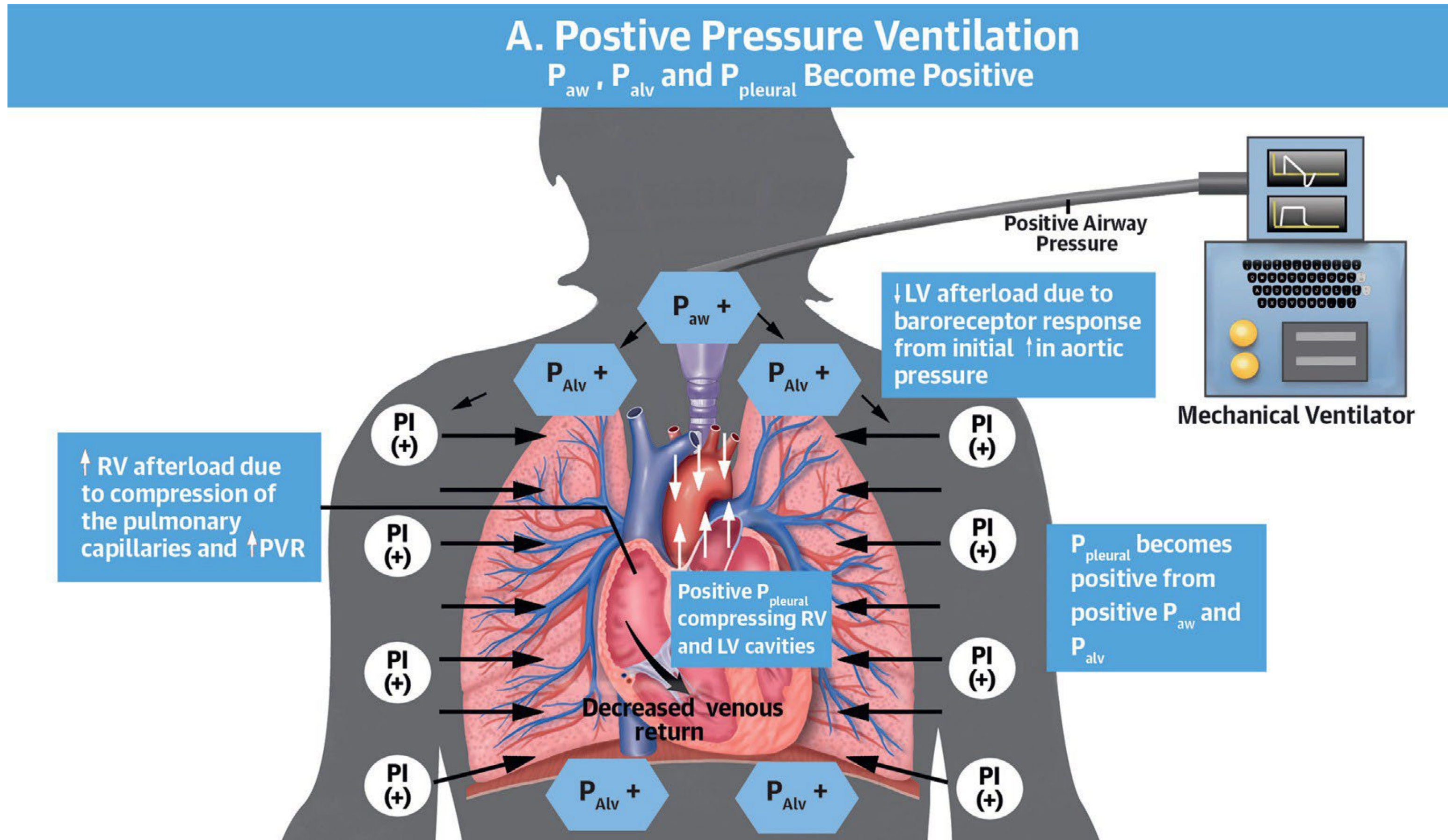
Inferior vena cava (IVC) – SvO<sub>2</sub> = 51%;  
Right atrium (RA) – SvO<sub>2</sub> = **45%**;  
Right ventricle – SvO<sub>2</sub> = **91%**  
Pressure = 58/9, RVEDP = 22;  
Q<sub>p</sub>:Q<sub>s</sub> 2:1



# Tratamiento



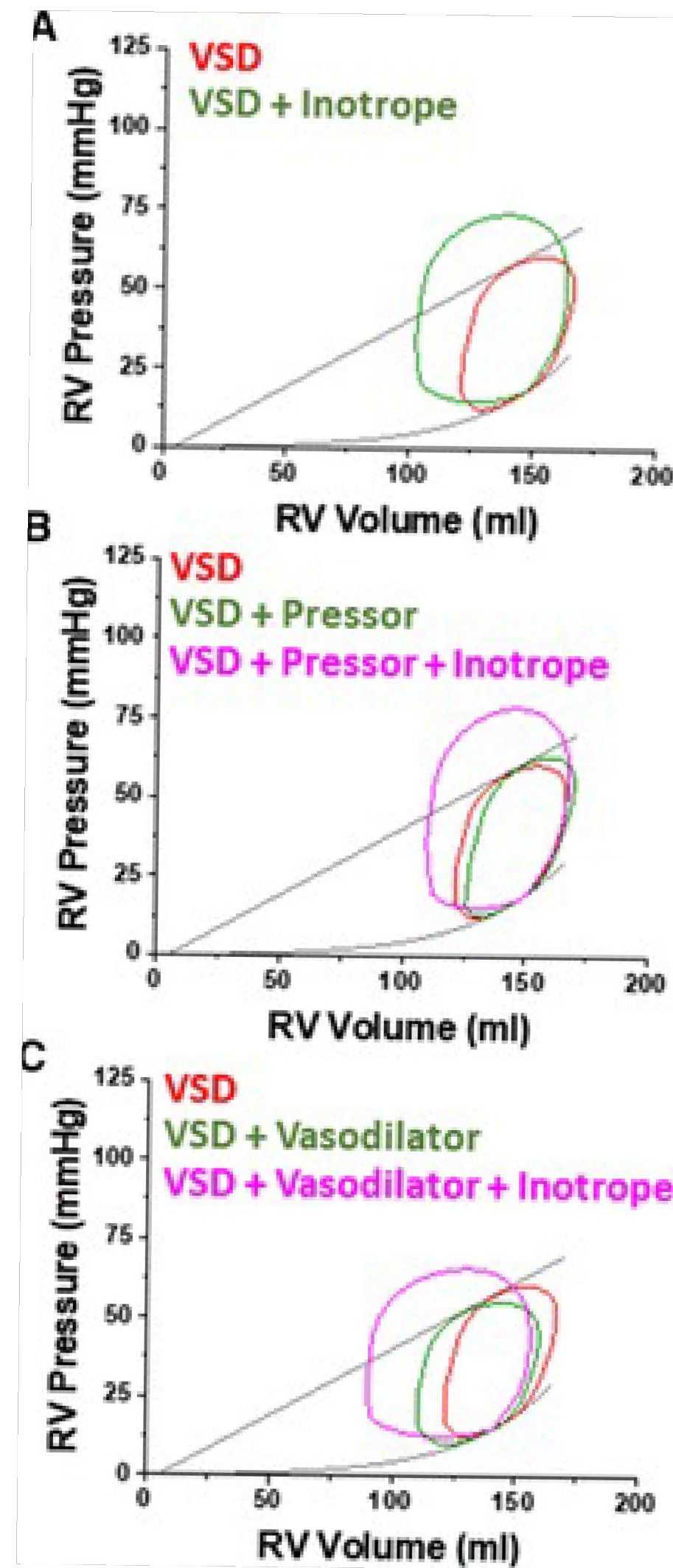
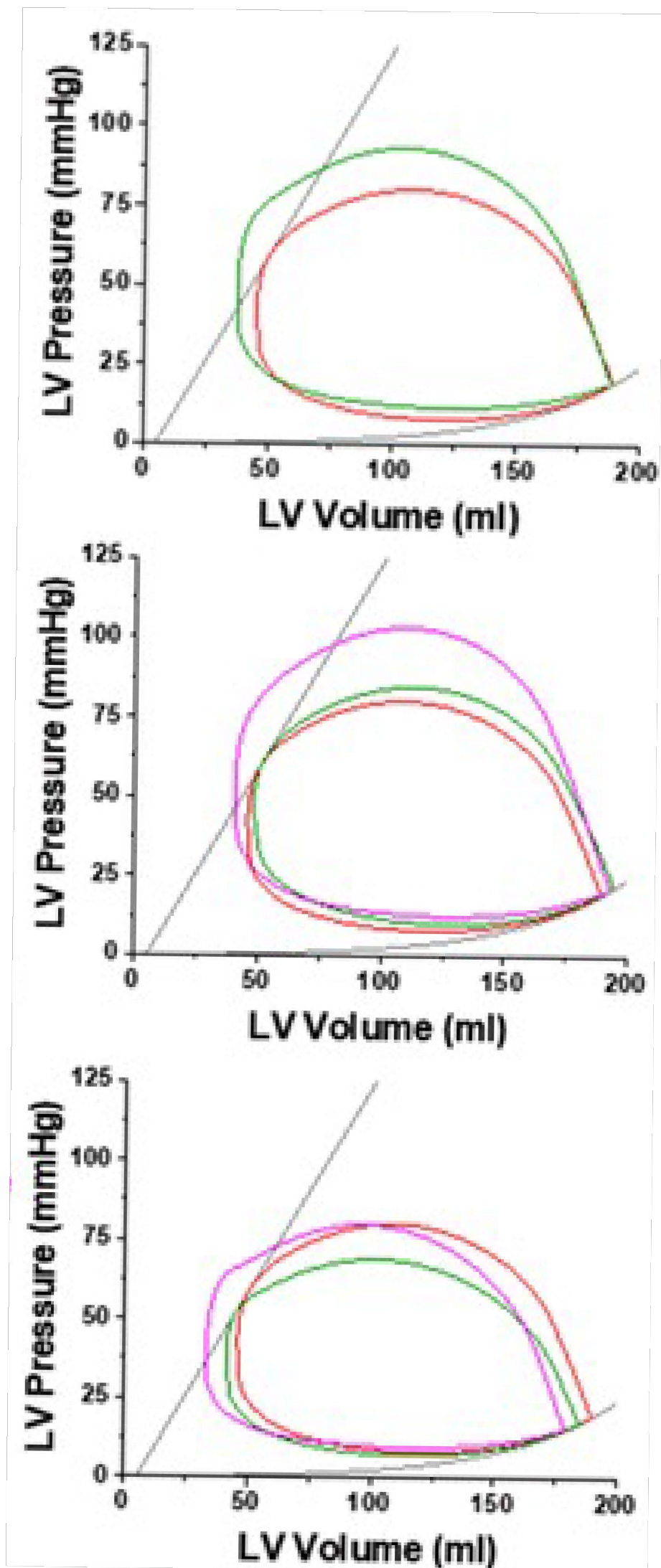
# Tratamiento: Ventilación con presión positiva





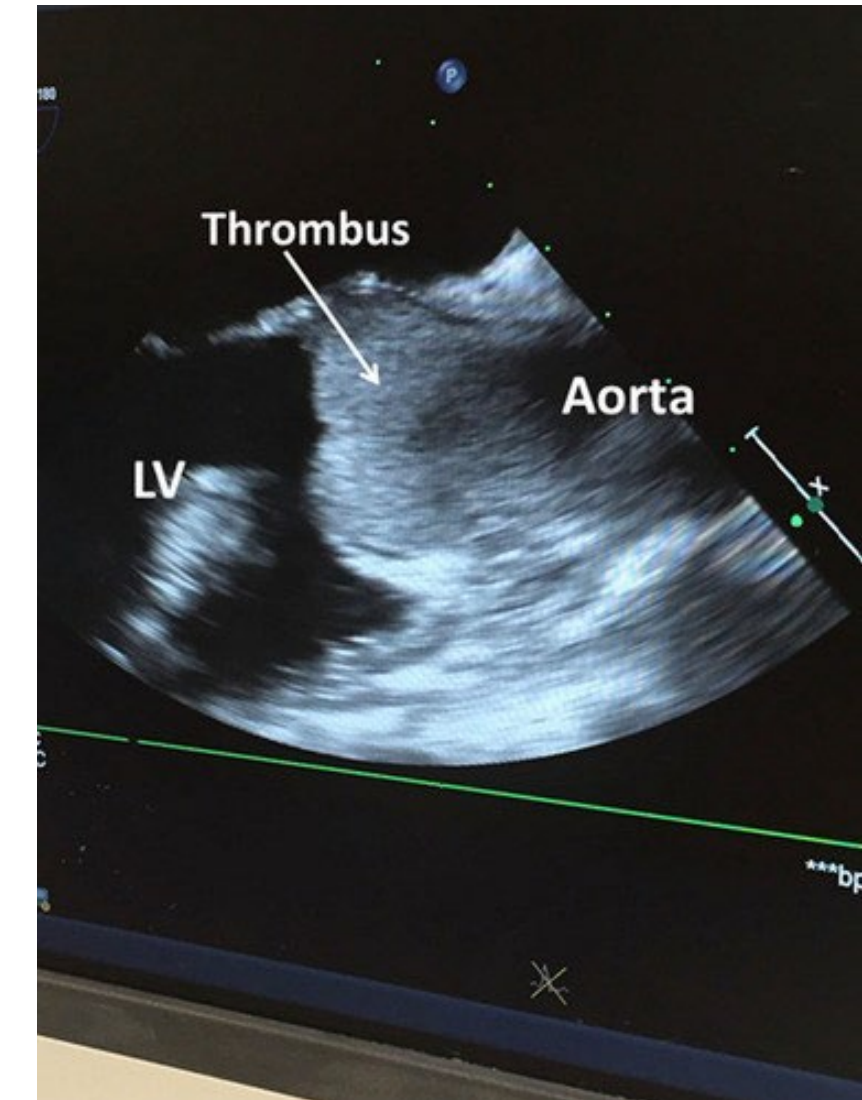
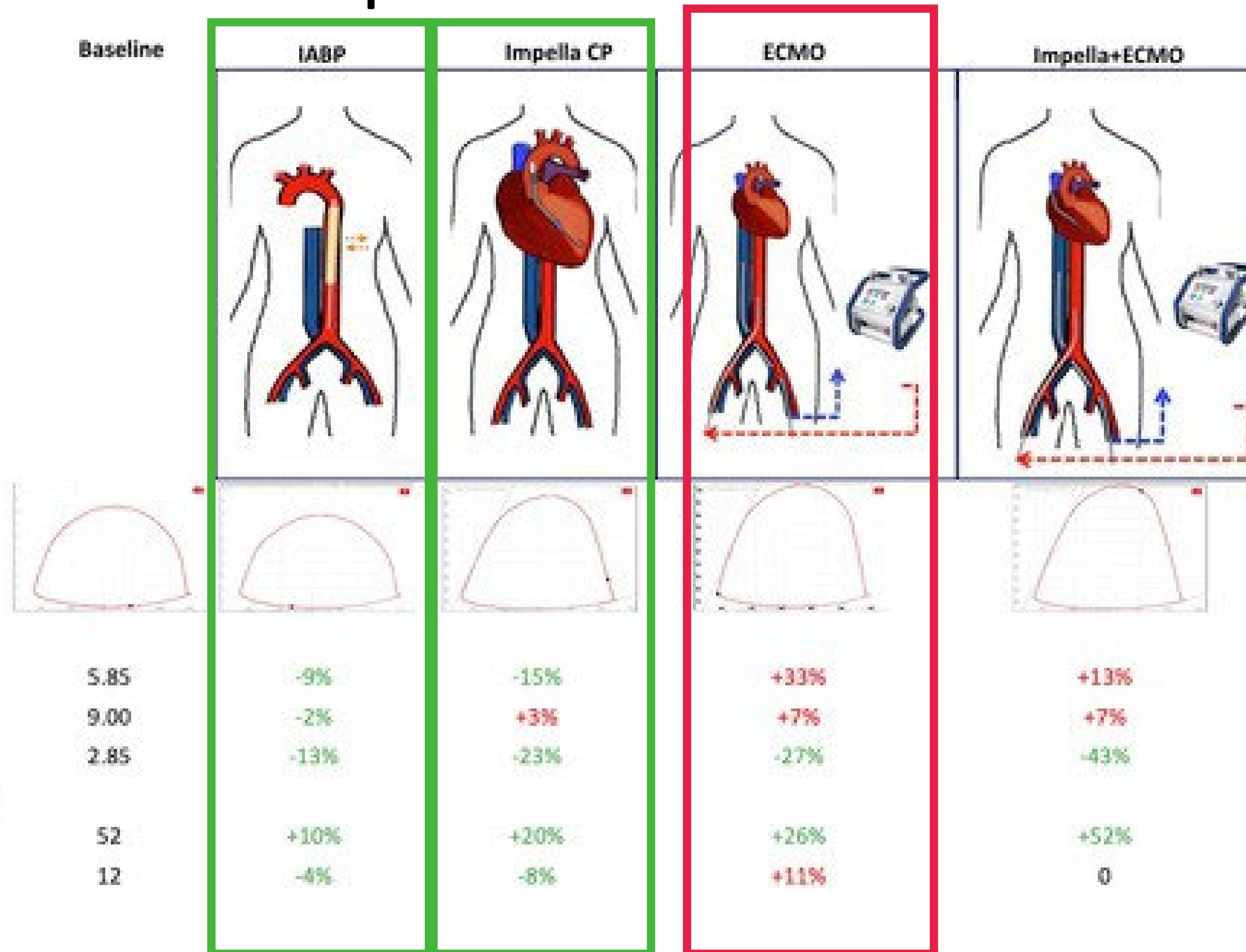
# Tratamiento: fármacos vasoactivos

	Baseline	Inotrope	Vasodilator	Vasodilator+Inotrope	Pressor	Pressor+Inotrope
Flows, L/min						
Aortic	3.8	<b>5.0</b>	<b>4.5</b>	6.2	<b>2.8</b>	<b>3.8</b>
MCS	n/a	n/a	n/a	n/a	n/a	n/a
VSD	7.5	<b>9.5</b>	<b>6.3</b>	7.3	<b>8.8</b>	<b>11.4</b>
PA	11.2	14.4	10.8	13.4	11.6	<b>15.1</b>
Total body	3.8	5.0	4.5	6.2	2.8	3.8
Qp:Qs	3.0	<b>2.9</b>	<b>2.4</b>	2.2	<b>4.0</b>	4.0
Pressures, mm Hg						
CVP	18	20	16	18	17	18
PA (mean)	40	49	36	43	42	53
PCWP	26	31	23	26	28	34





# Tratamiento: Soporte circulatorio mecánico

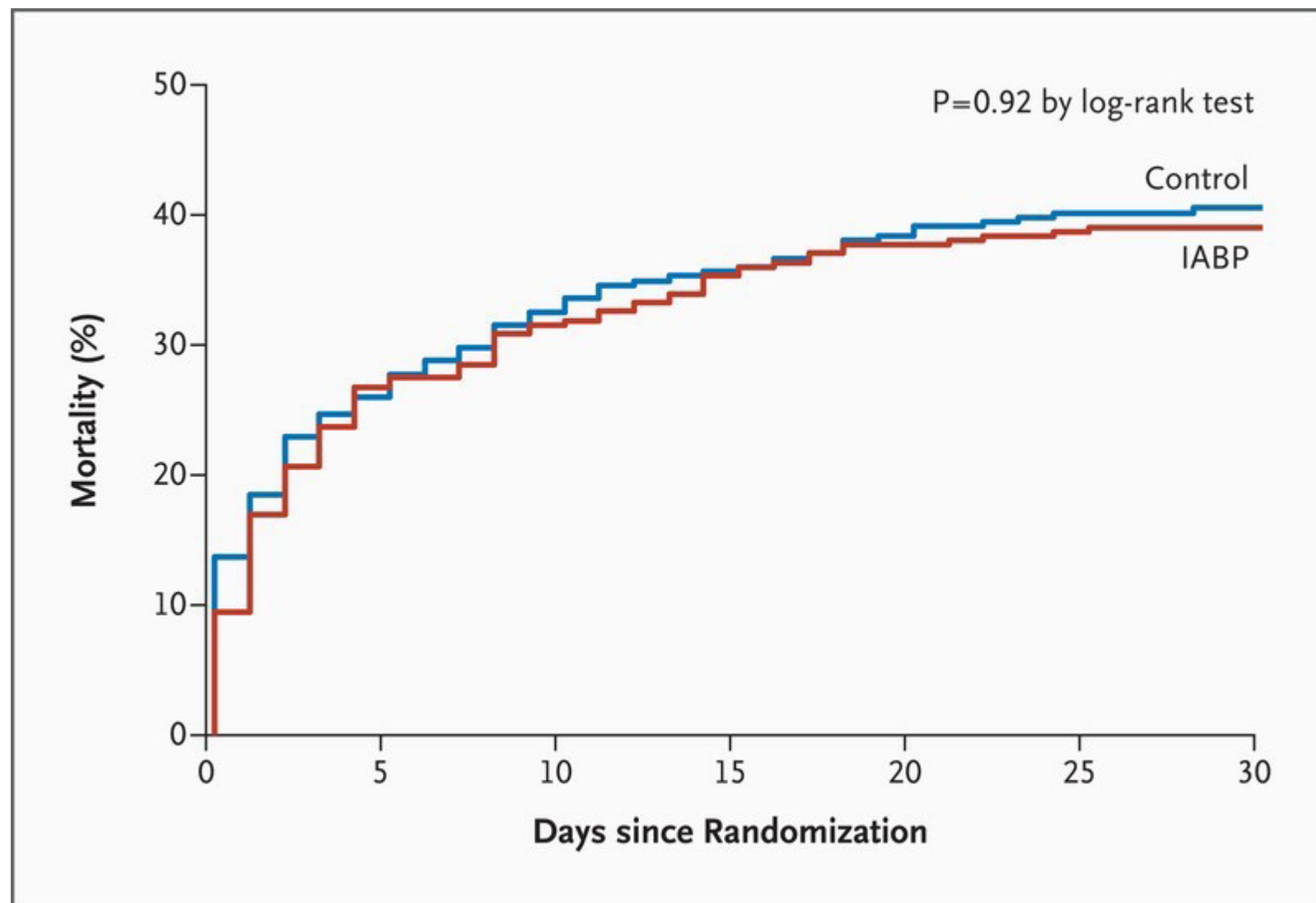


Routine intra-aortic balloon pumping is not indicated. <sup>177,437</sup>

III

B

“Routine IABP counterpulsation cannot be recommended, but **may be considered for haemodynamic support in selected patients (i.e. severe mitral insufficiency or ventricular septal defect).**”



IABP-SHOCK II trial

“Patients **were not eligible for the study if... had a mechanical cause of cardiogenic shock (e.g., ventricular septal defect or papillary muscle rupture);**”

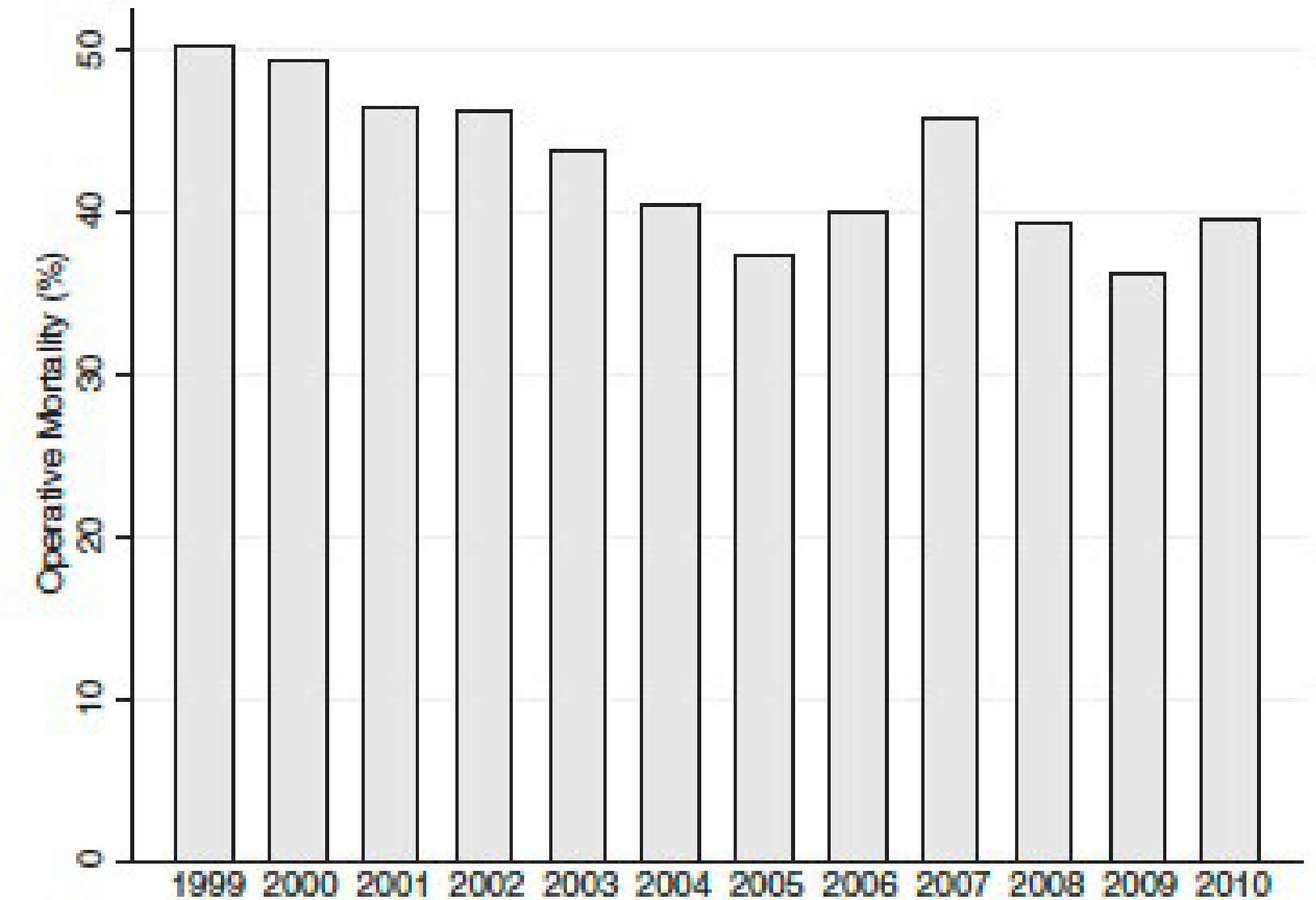
# Tratamiento: cirugía

- Registro CAUTION: 2001 - 2019
- N = 475

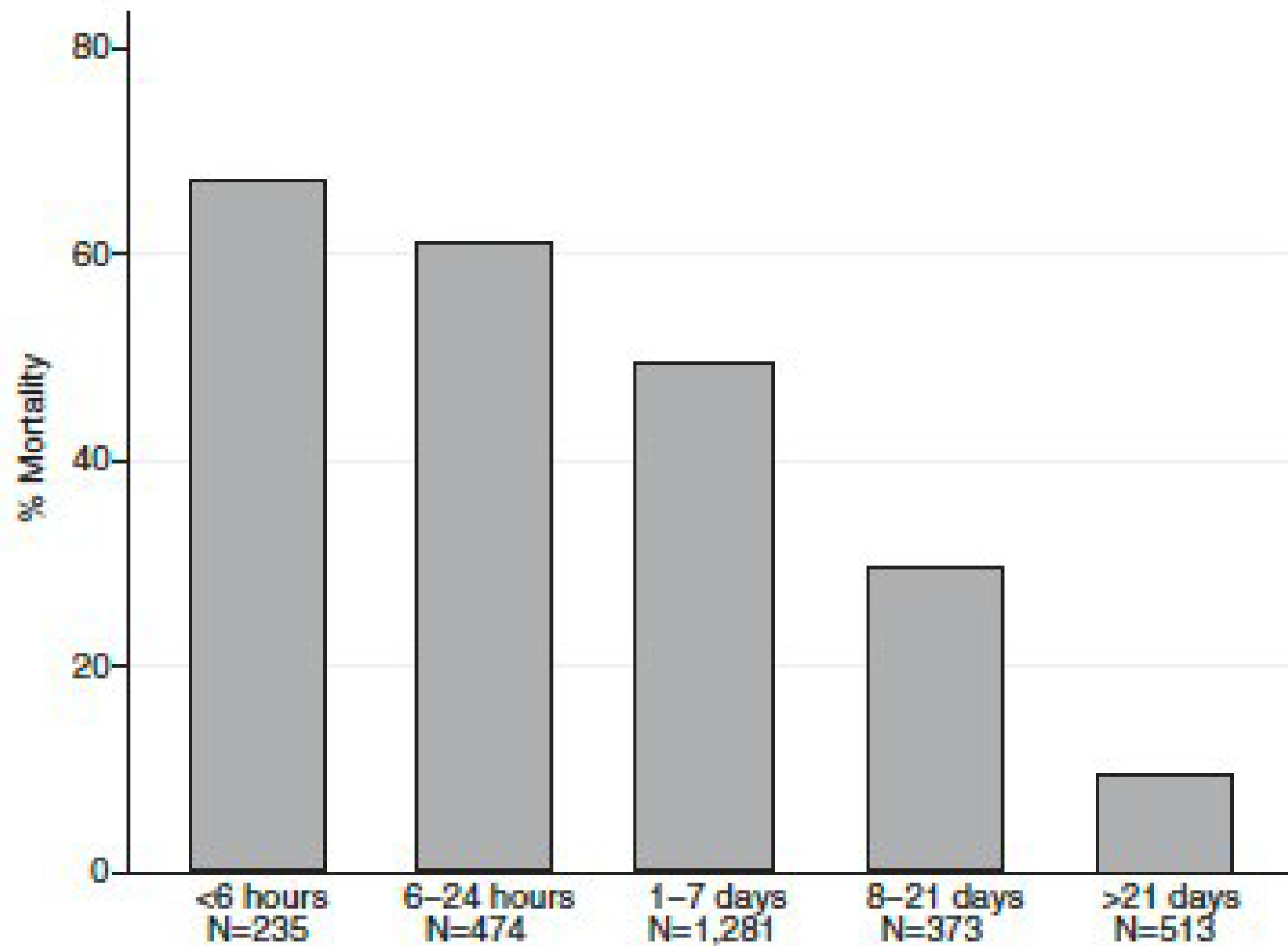
- Registro STS: 1999 - 2010
- N = 2.876

Table 3. Postoperative Outcomes and Causes of In-Hospital Mortality

Variable	Patients, No. (%) (N = 475)
Intraoperative mortality	16 (3.4)
Ventilation time, mean (SD), d	5.2 (8.3)
ICU stay, mean (SD), d	11 (23)
Hospital stay, mean (SD), d <sup>a</sup>	23.4 (27.4)
In-hospital mortality	192 (40.4)
Causes of death <sup>b</sup>	
Intraoperative	16 (8.3)
No CPB weaning	11 (5.7)
Incontrollable bleeding	5 (2.9)



# ¿Emergente o diferida?



Post-MI VSR

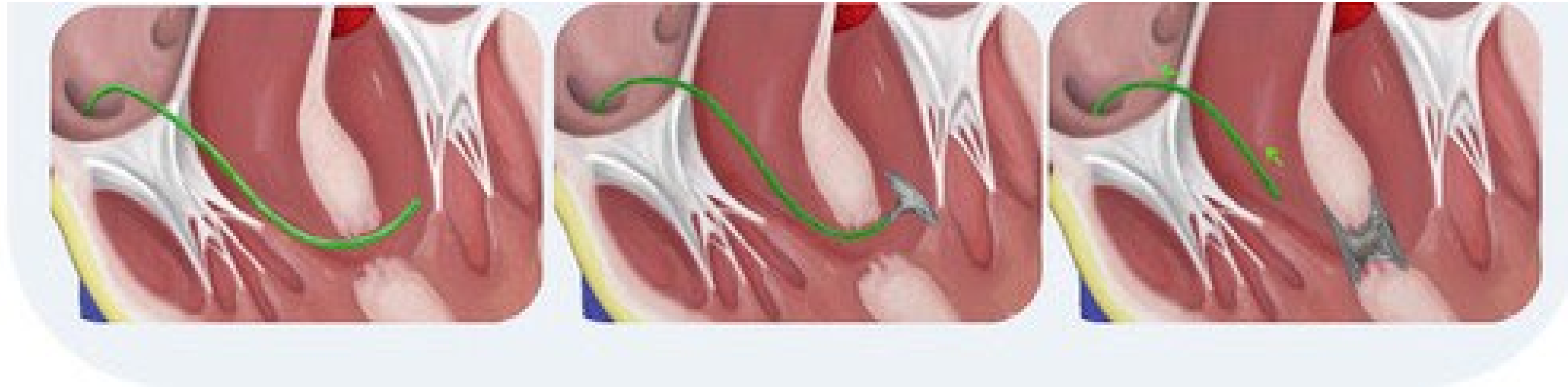
mechanical support

**TABLE 1 Time to Intervention and Associated Mortality Rates in Post-MI VSR: Percutaneous Device Closure vs Surgical Repair vs Conservative Management**

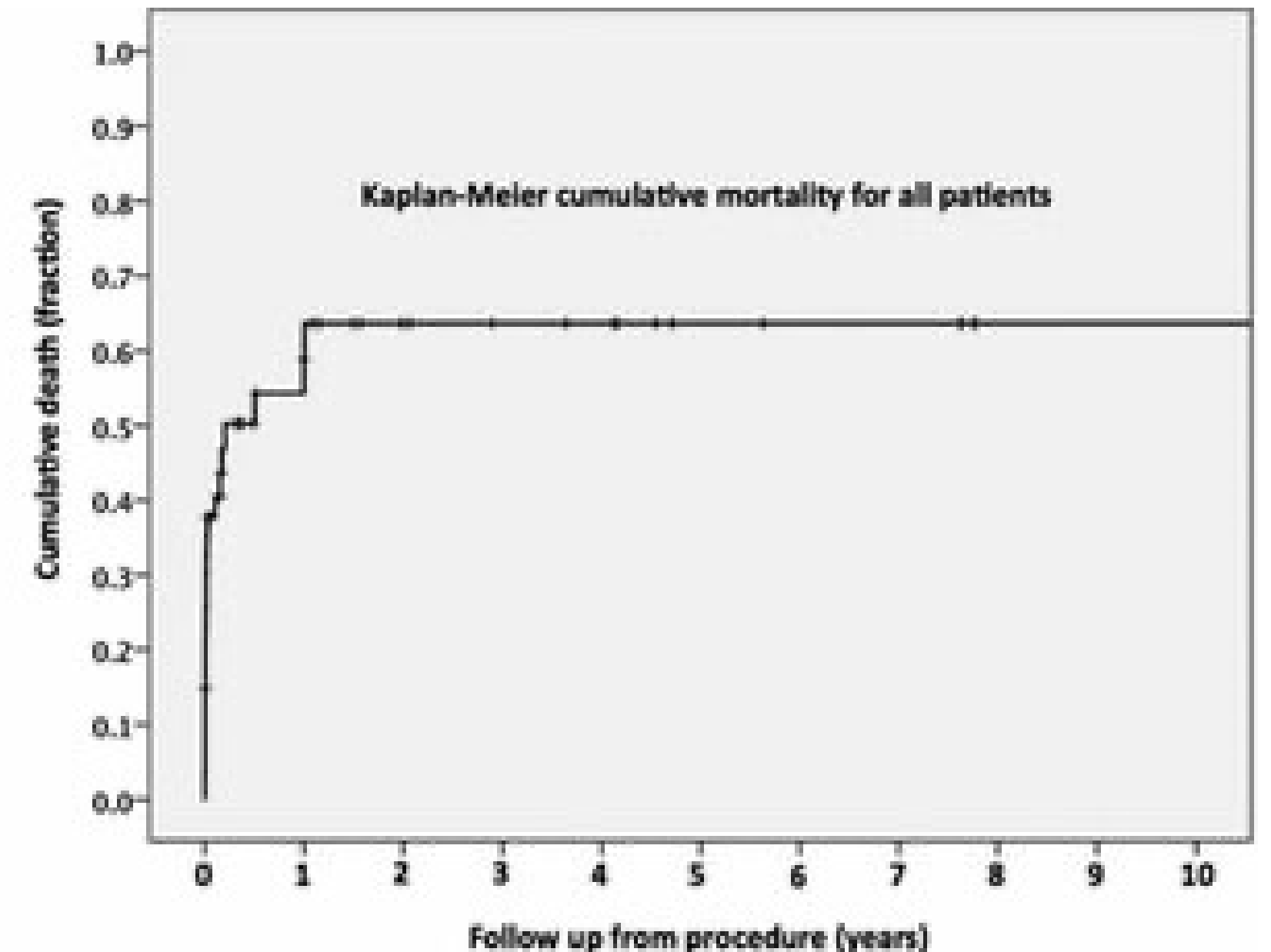
	Percutaneous Closure <sup>a</sup>	Surgical Repair <sup>b</sup>	Conservative Management <sup>c</sup>
Timing-associated mortality, d	—	—	94% (n = 35)
0-1	—	60% (n = 709)	—
1-3	88% (n = 16)	—	—
1-7	—	50% (n = 1,281)	—
4-16	38% (n = 13)	—	—
8-21	—	30% (n = 373)	—
>21	—	10% (n = 513)	—

surgery

# Tratamiento: tratamiento percutáneo



- 53 pacientes de 11 centros en UK (1997 – 2012)
- 66% IAM anterior, 34% inferior
- Mediana hasta procedimiento 13 días
- Éxito procedimiento 89%
- Supervivencia al alta del 58%





# Caso rotura del septo interventricular

Varón de 62 años.

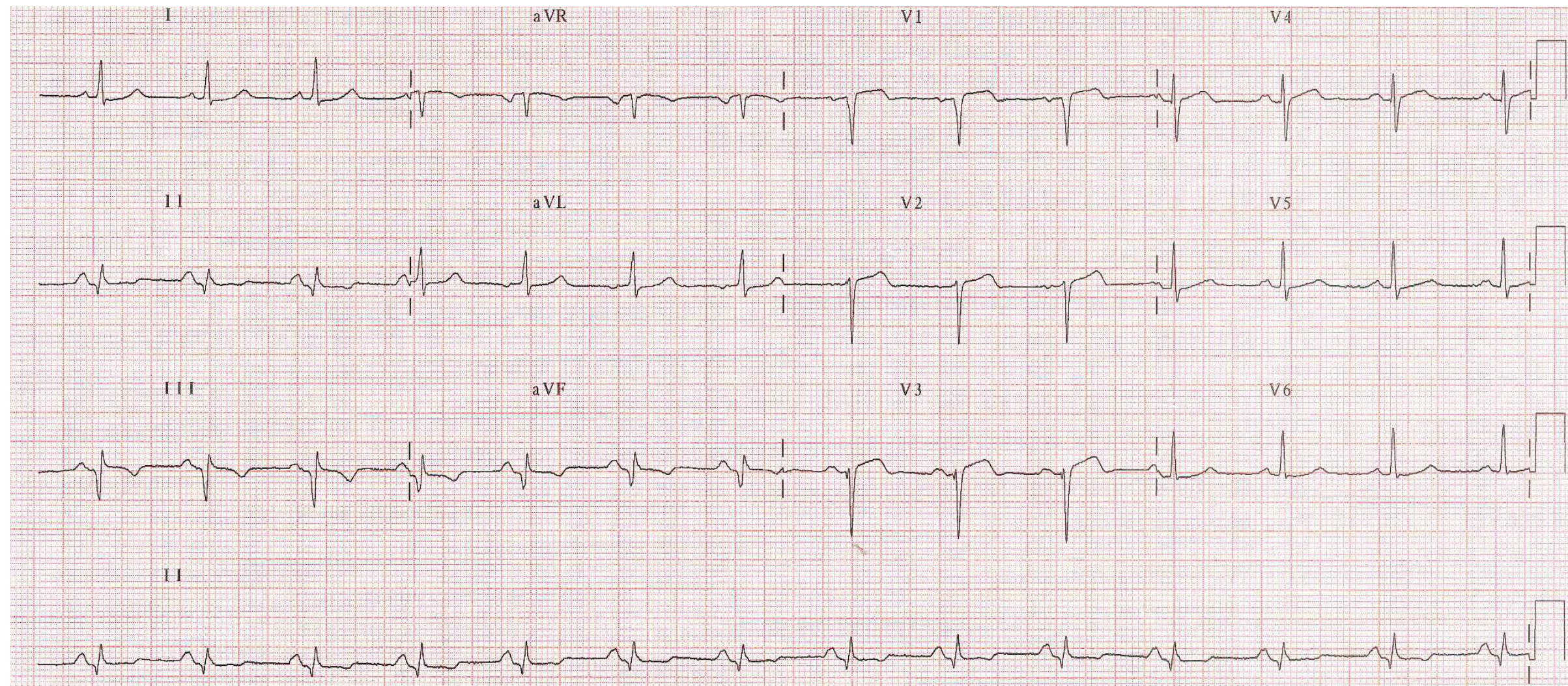
Dolor torácico hace 5 días > disnea y malestar general

PA 100/60 mmHg, FC 110 lpm. Taquipnea, mala perfusión distal

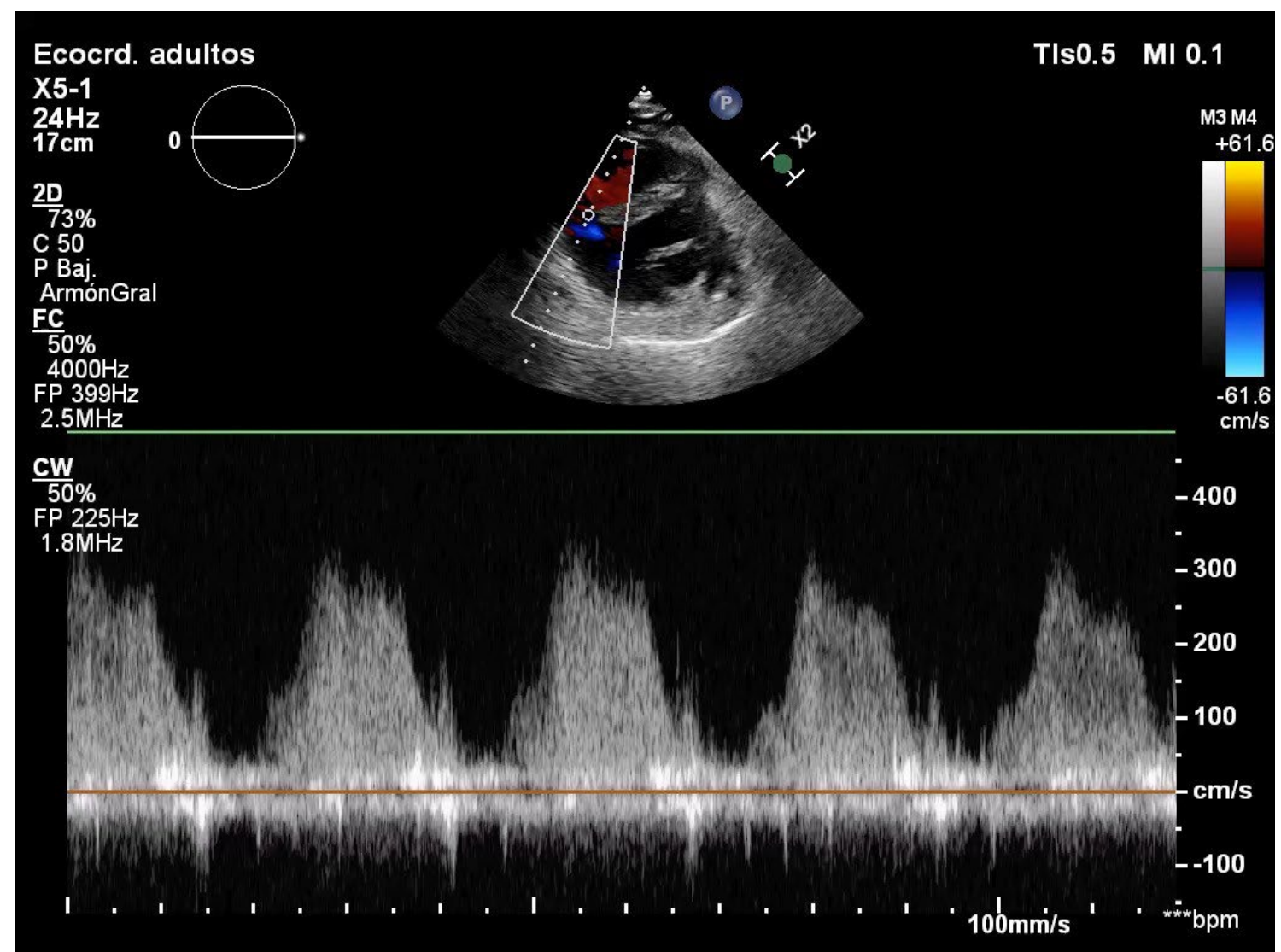
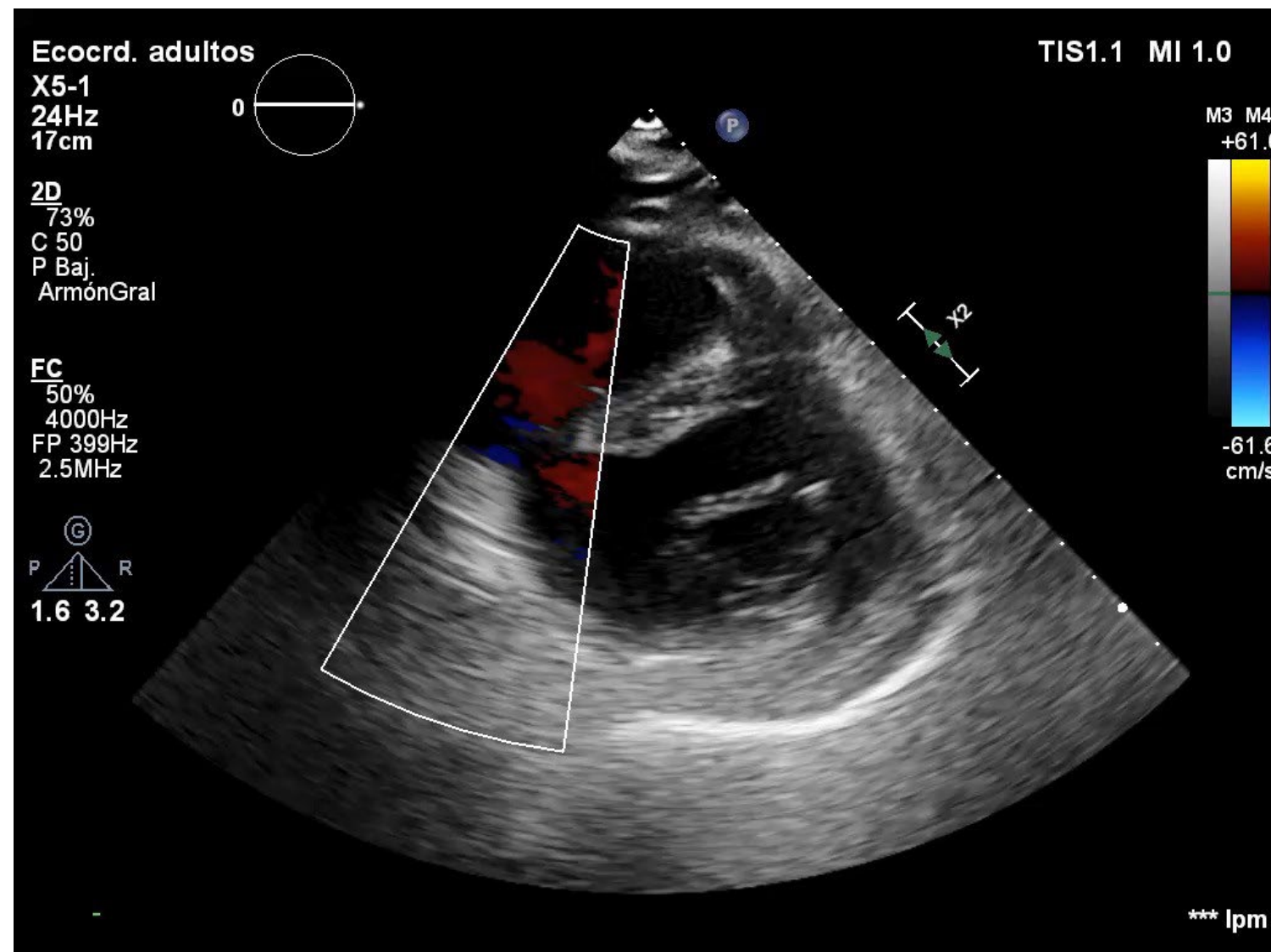
Soplo holosistólico

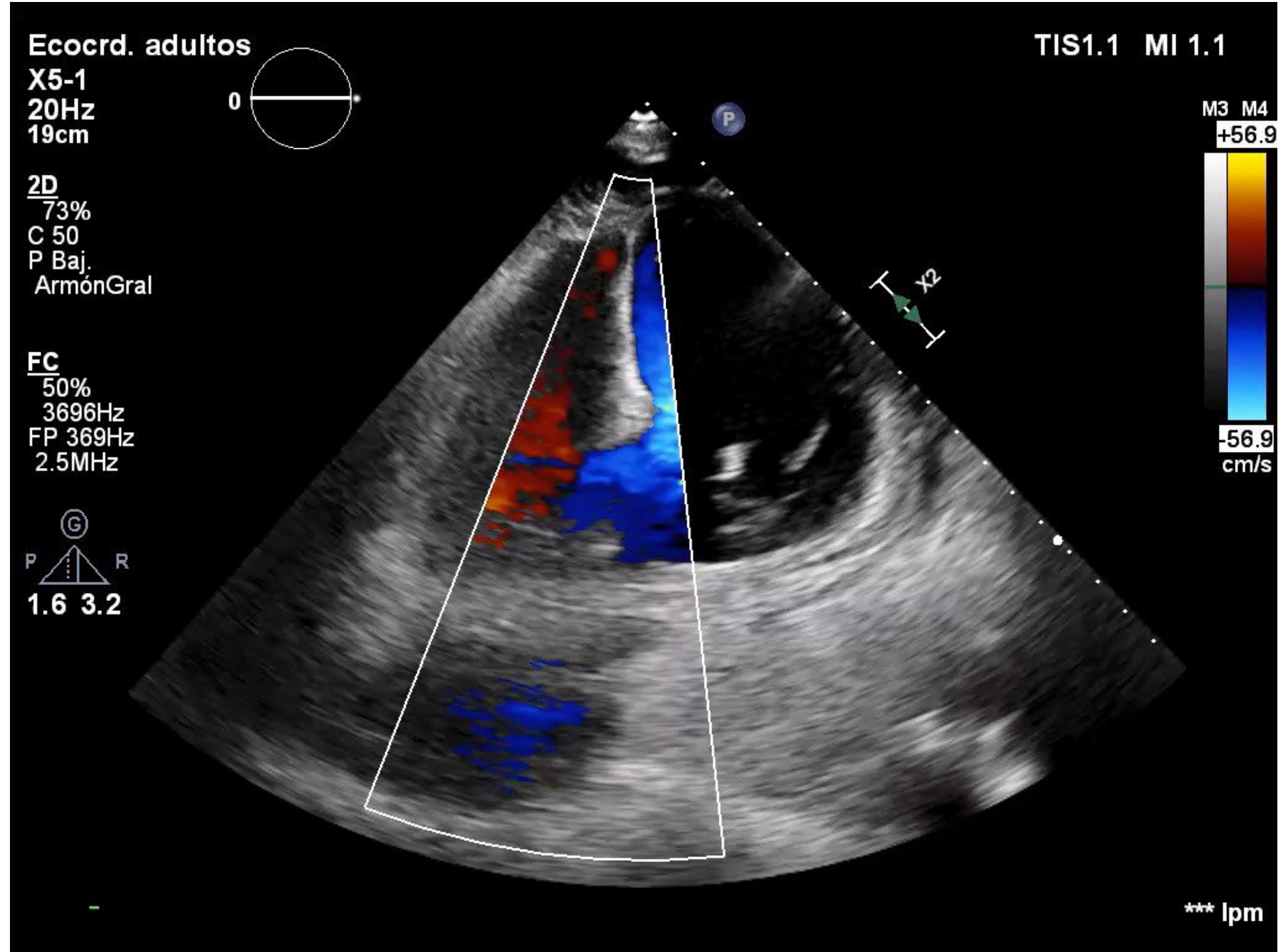
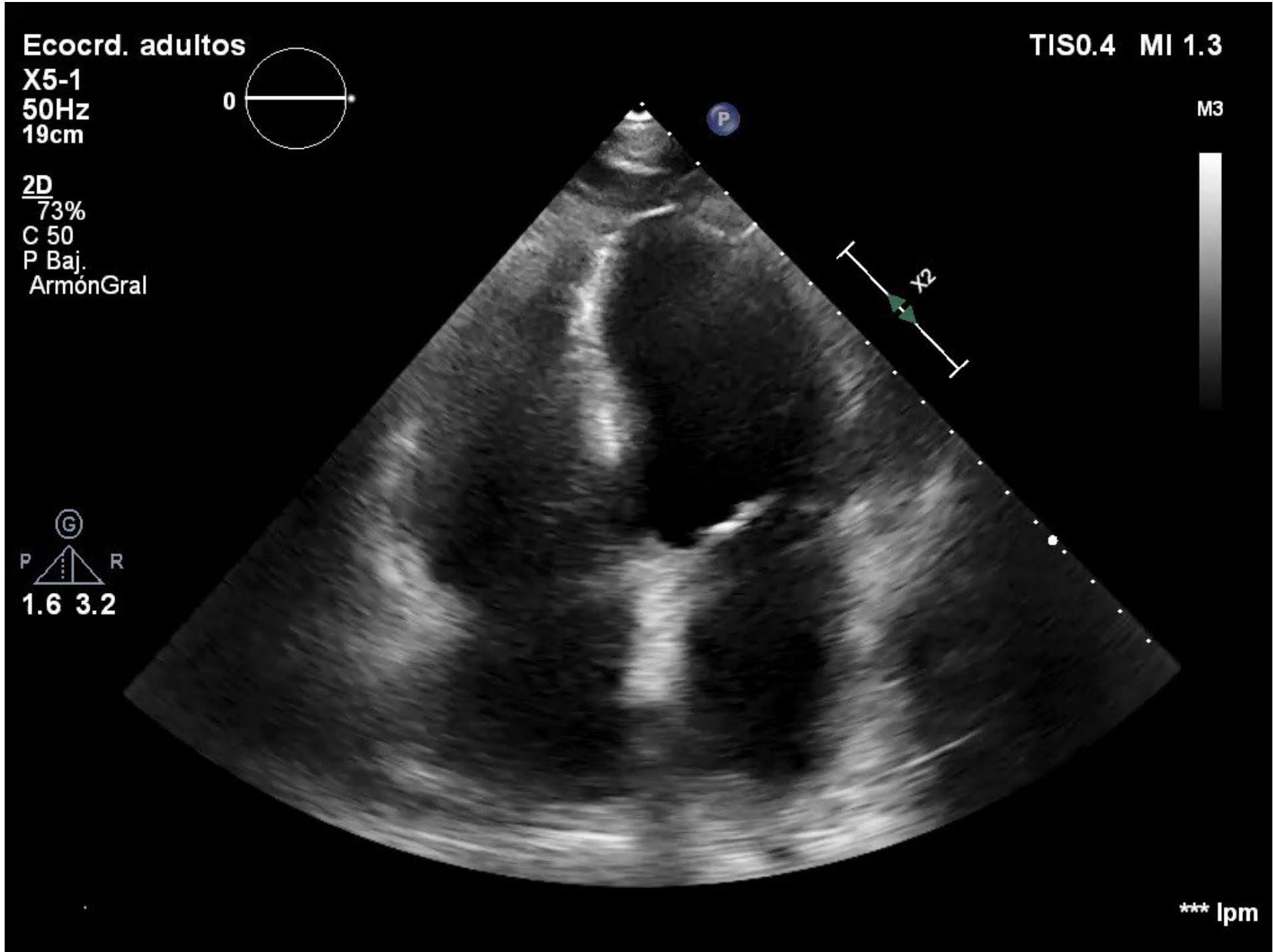
Gasometría venosa: pH 7,13 pCO<sub>2</sub> 34 HCO<sub>3</sub> 14 Lactato 6,7

Oclusión CD proximal; lesiones severas DA y Cx





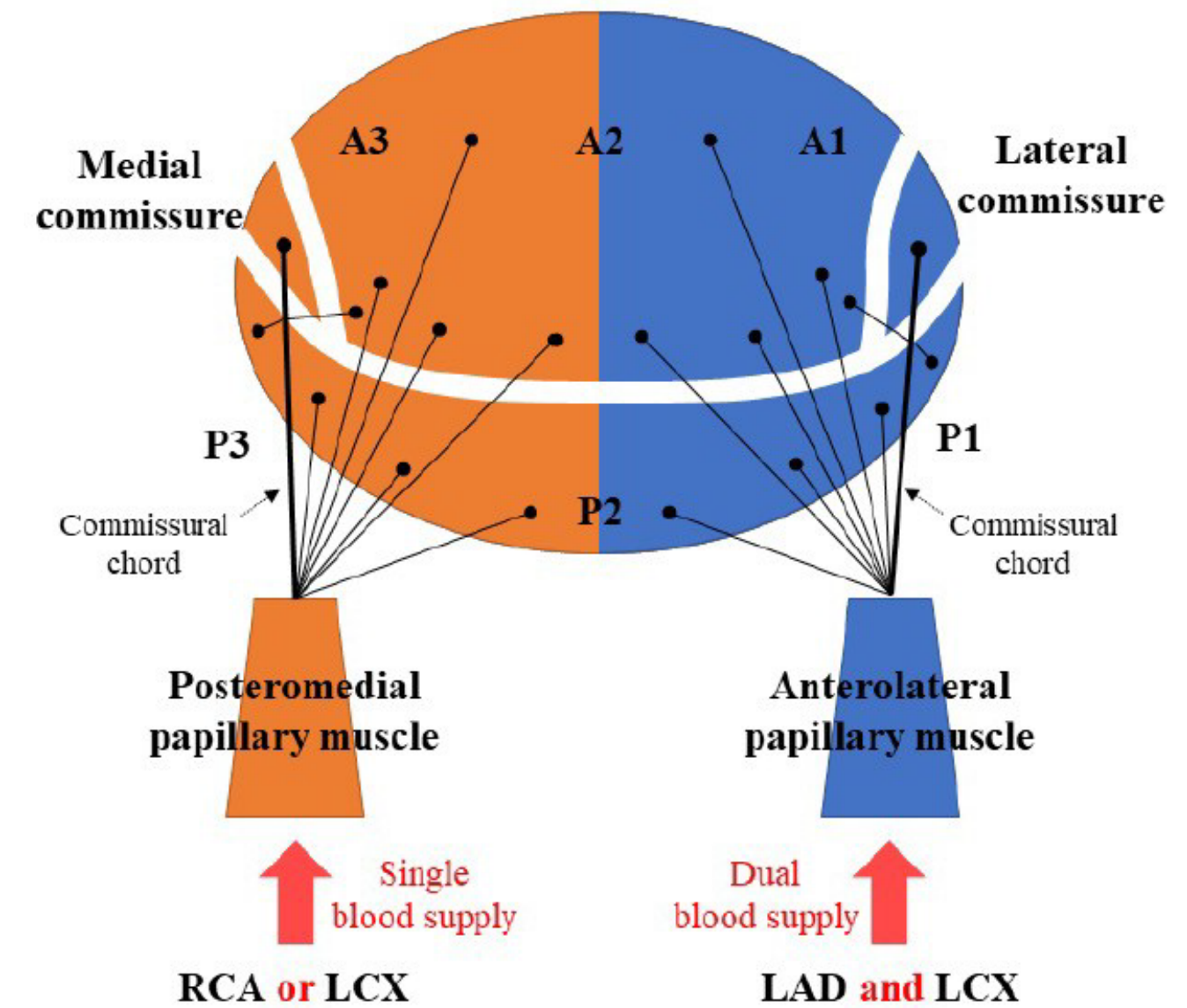
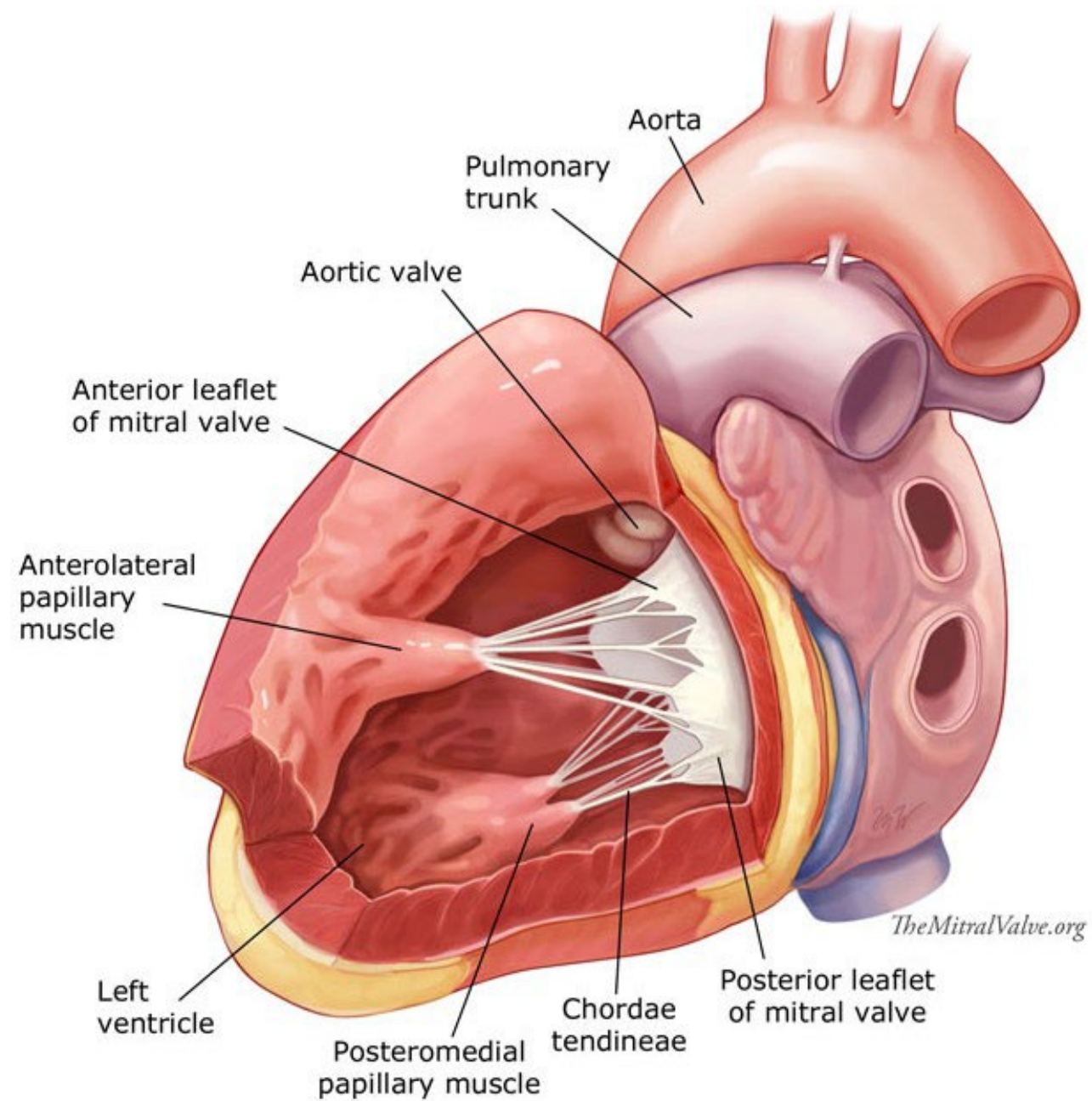




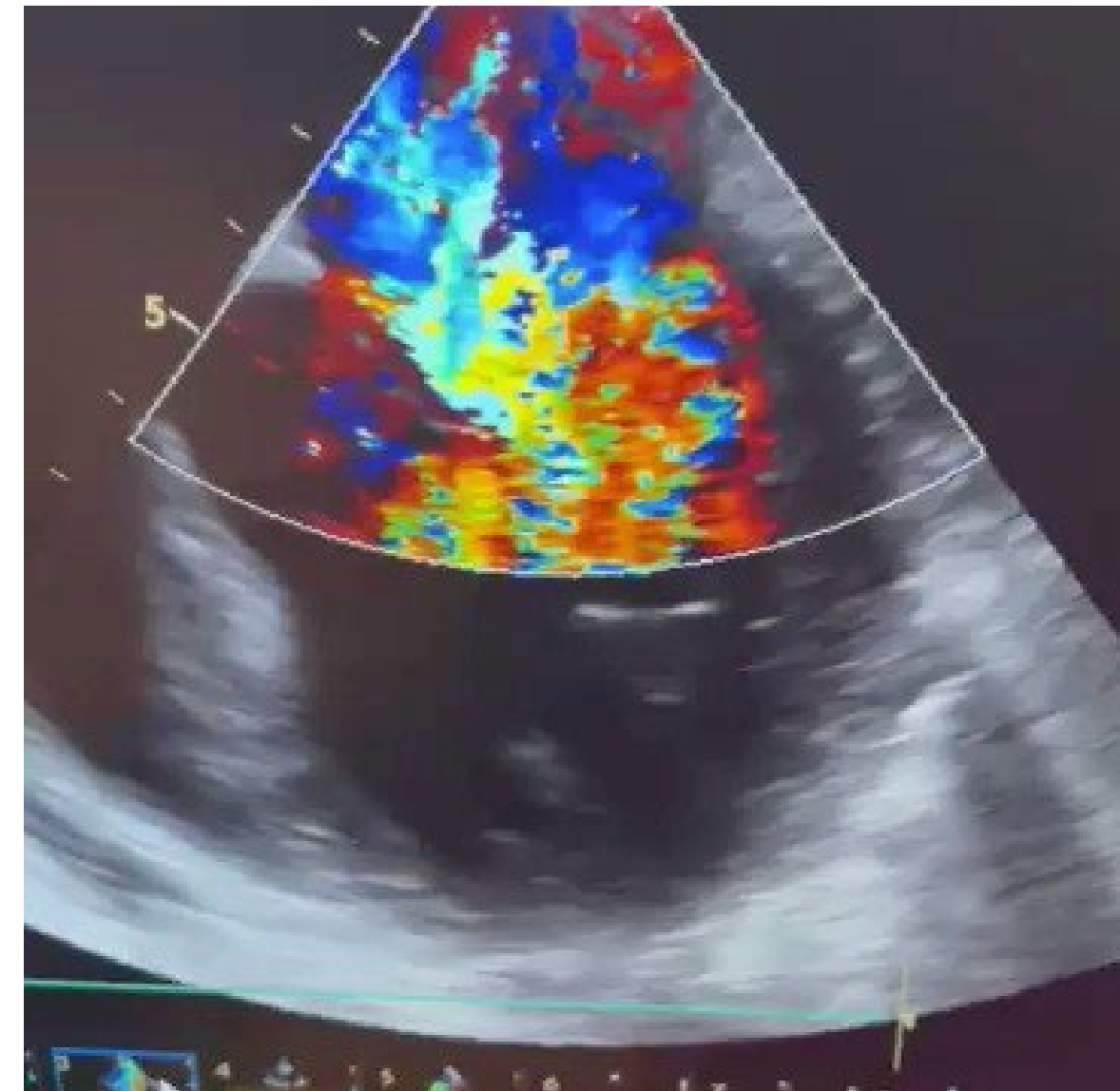


# Insuficiencia mitral aguda por ruptura de músculo papilar

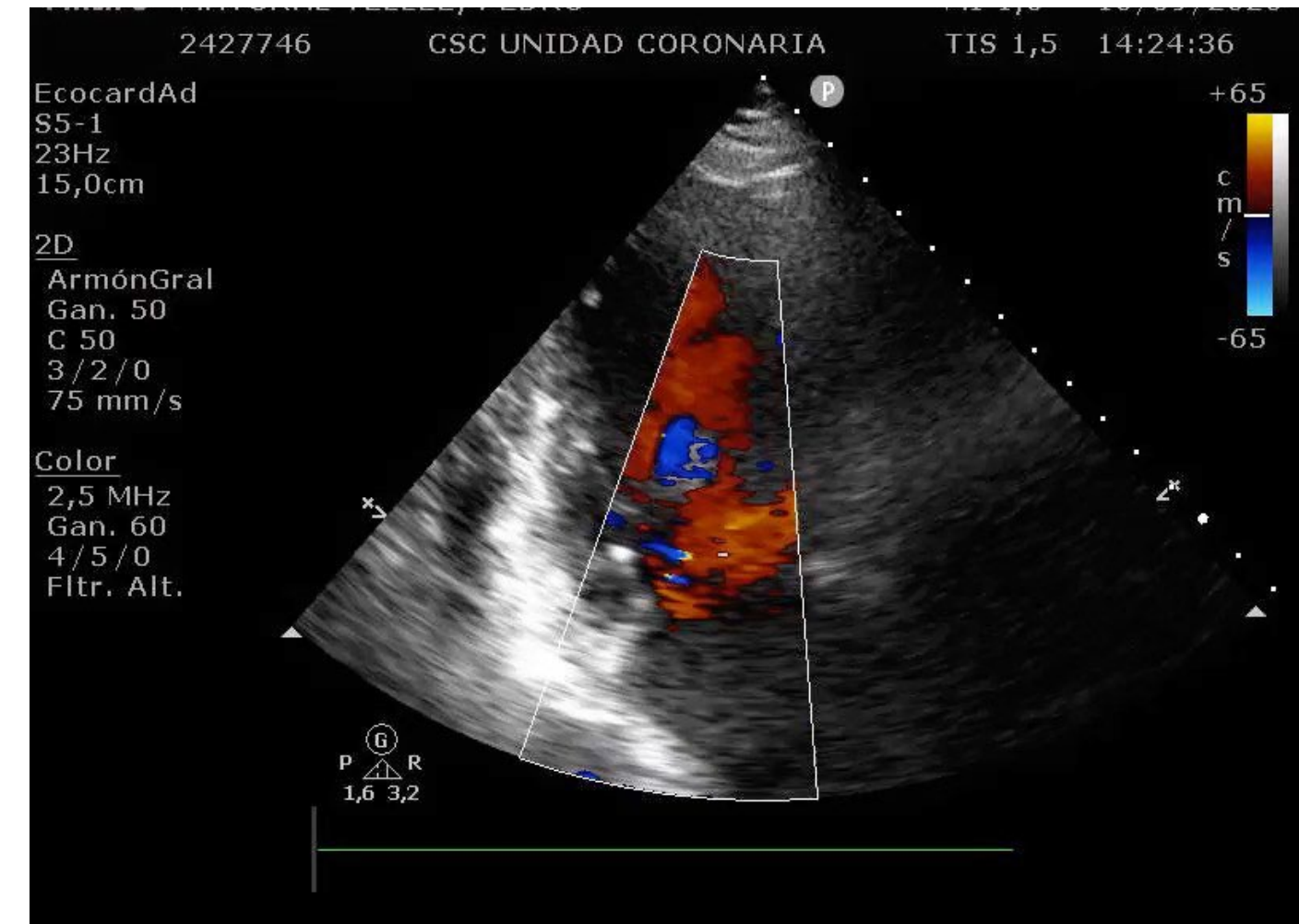
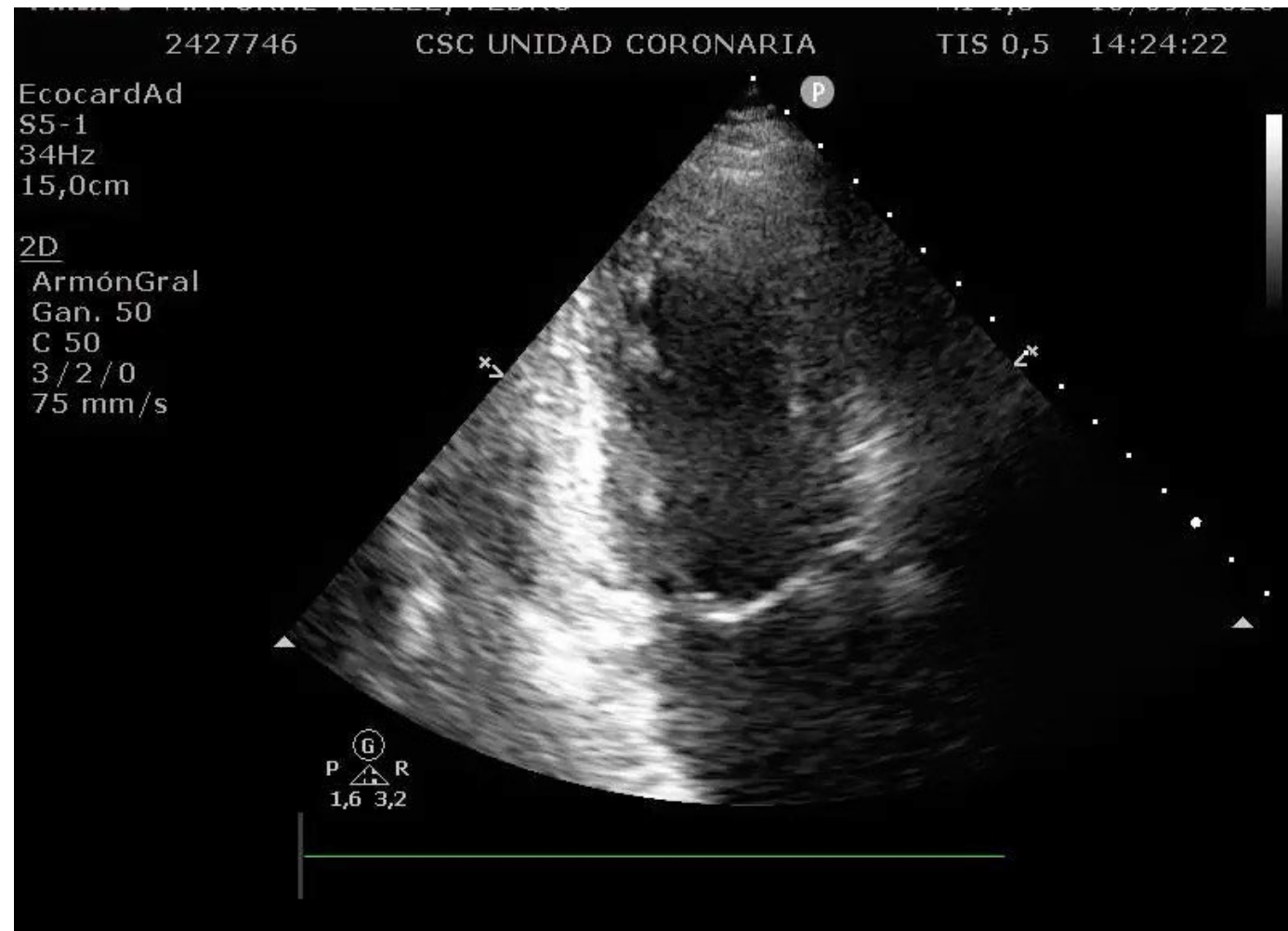
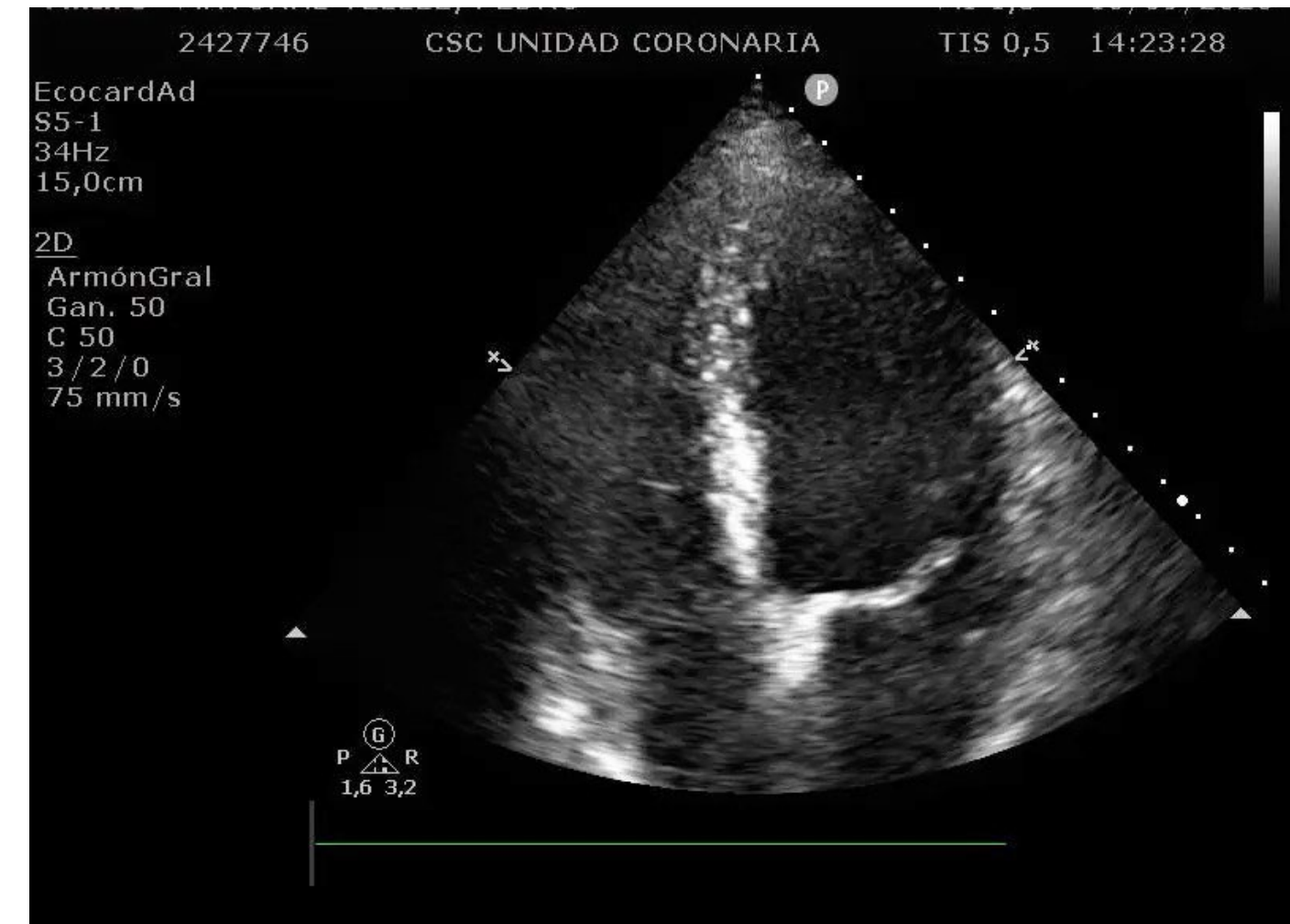
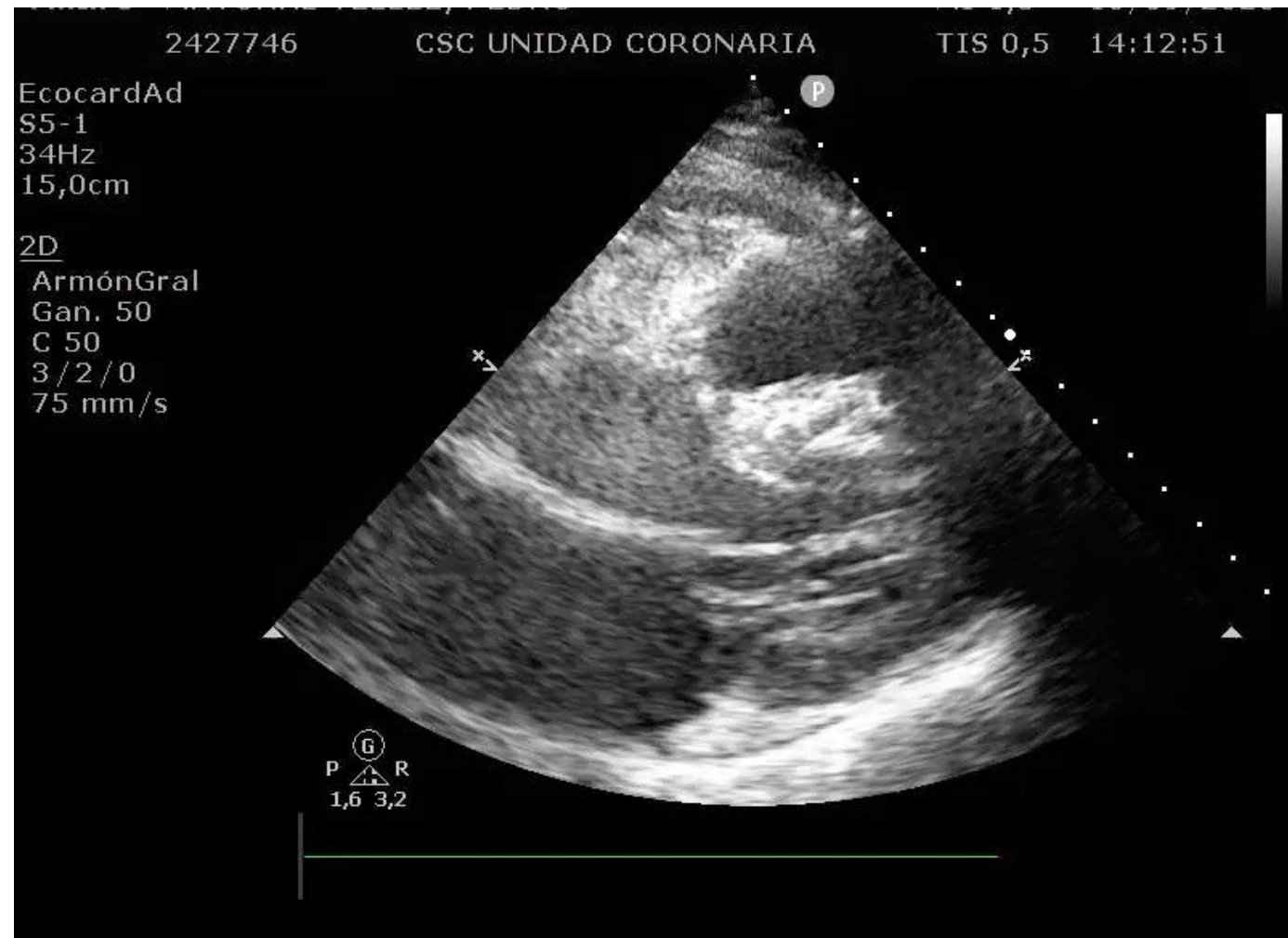
- Mortalidad entre 10-40%.
- A los 3-5 días de un infarto inferior o lateral.



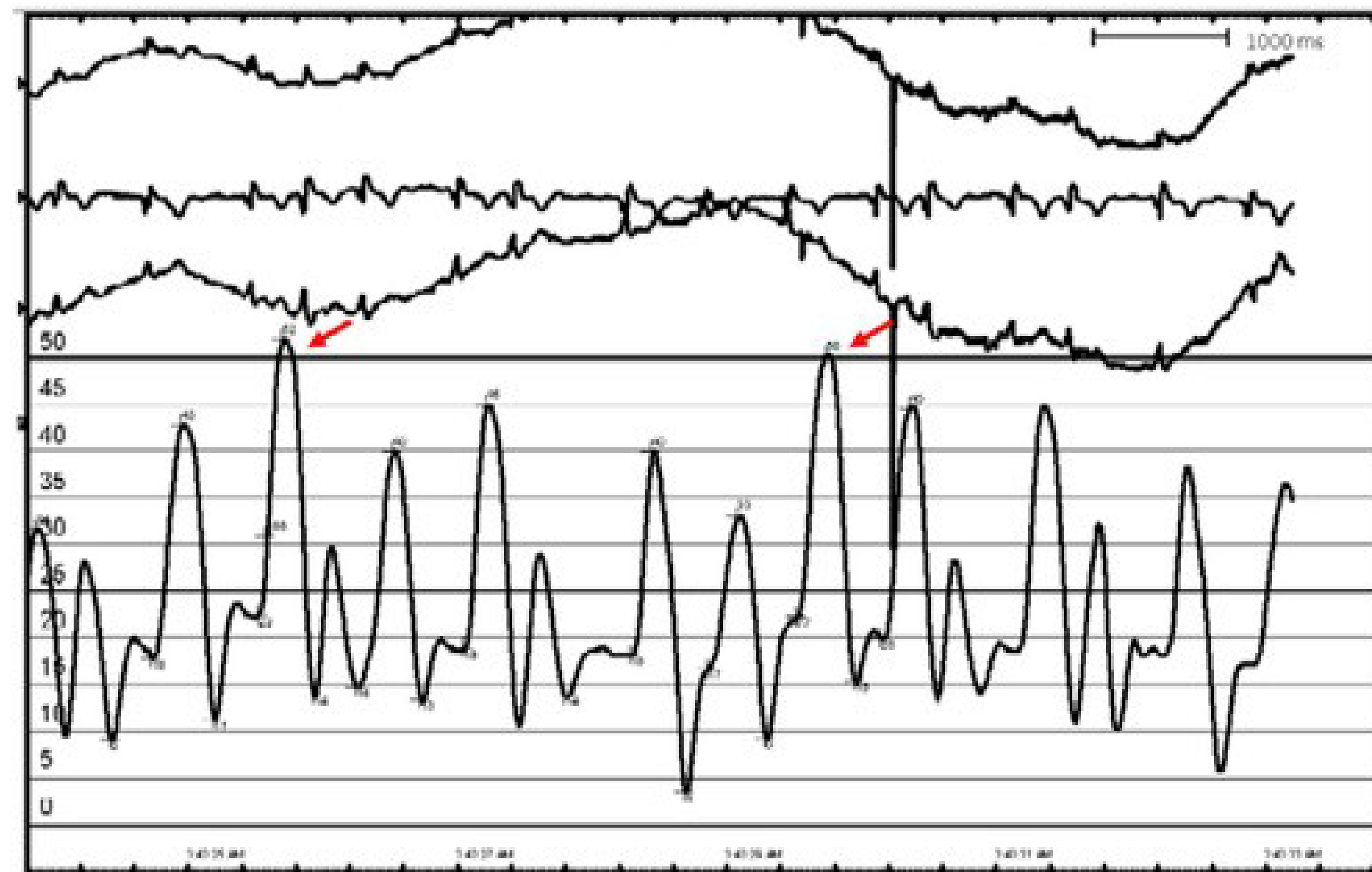
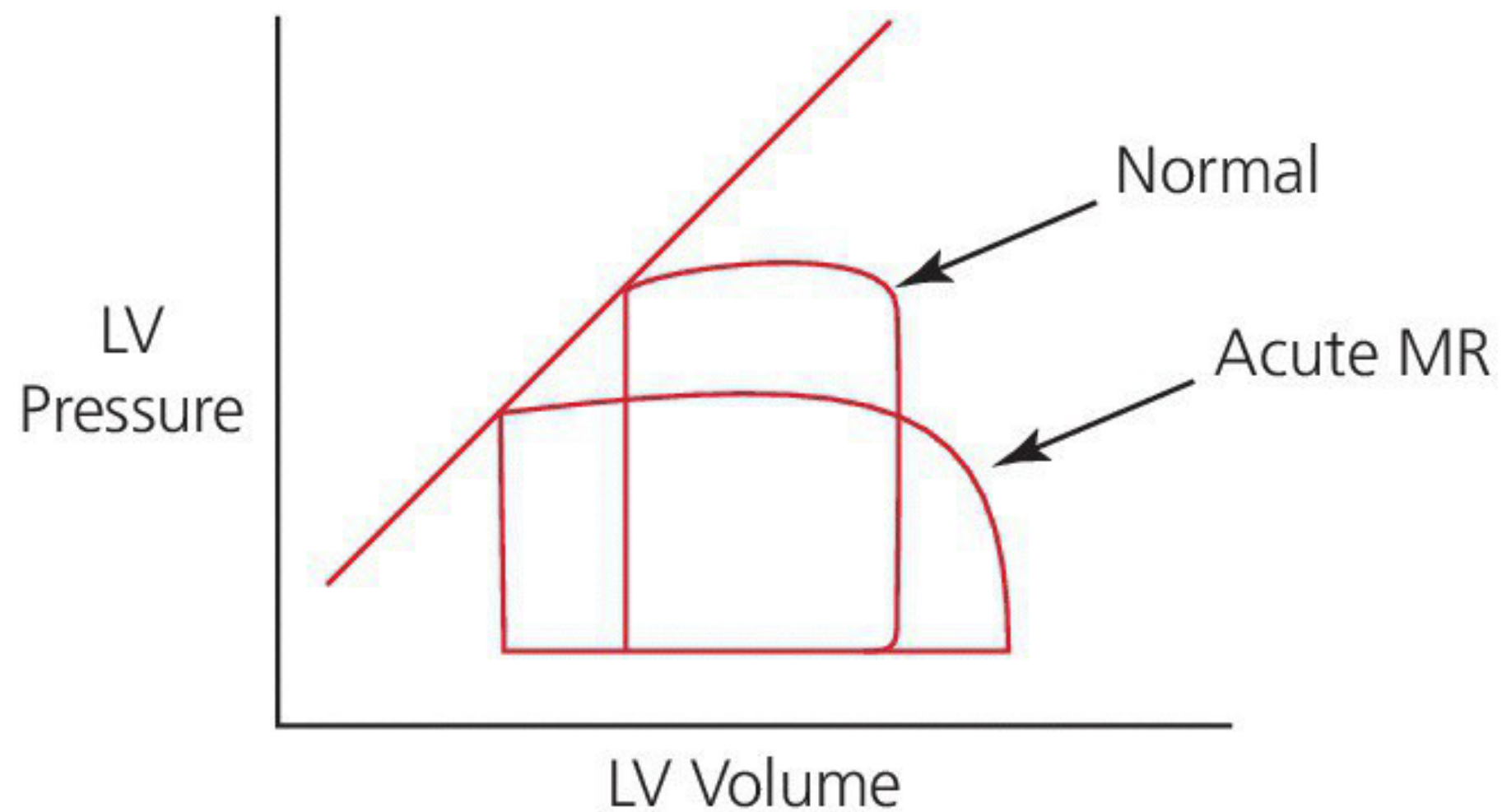
# Diagnóstico: Ecocardiograma





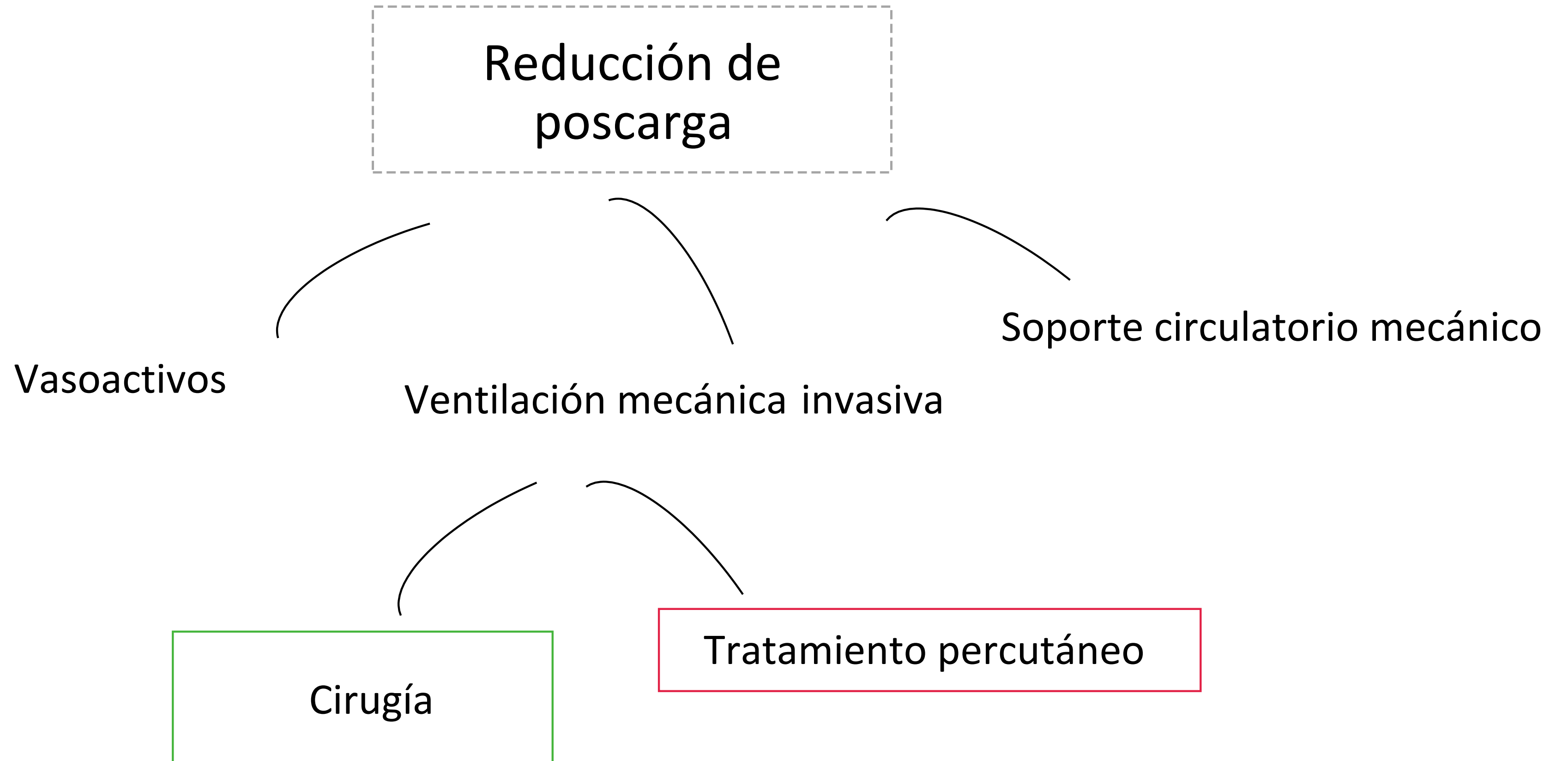


# Fisiopatología

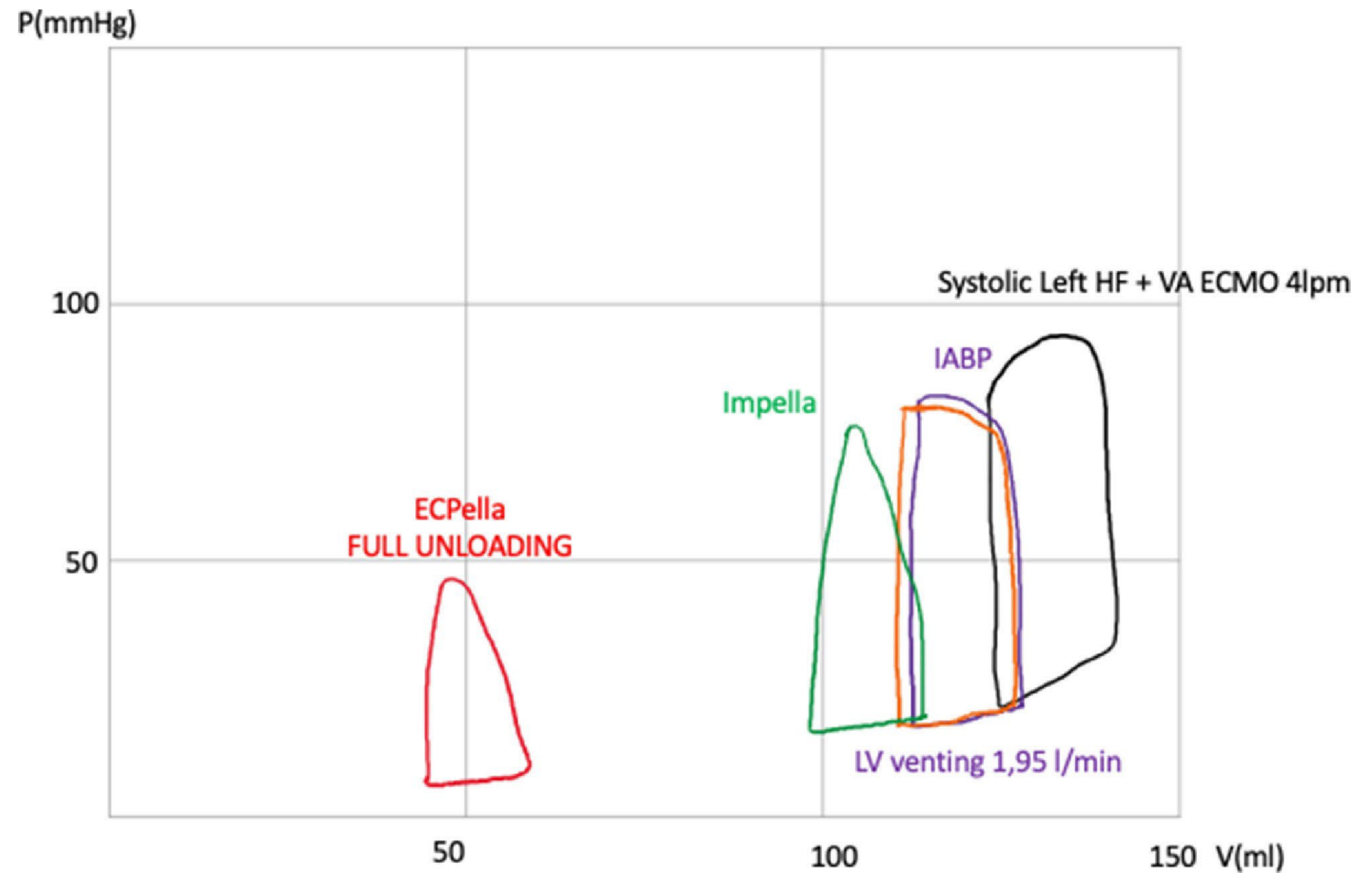
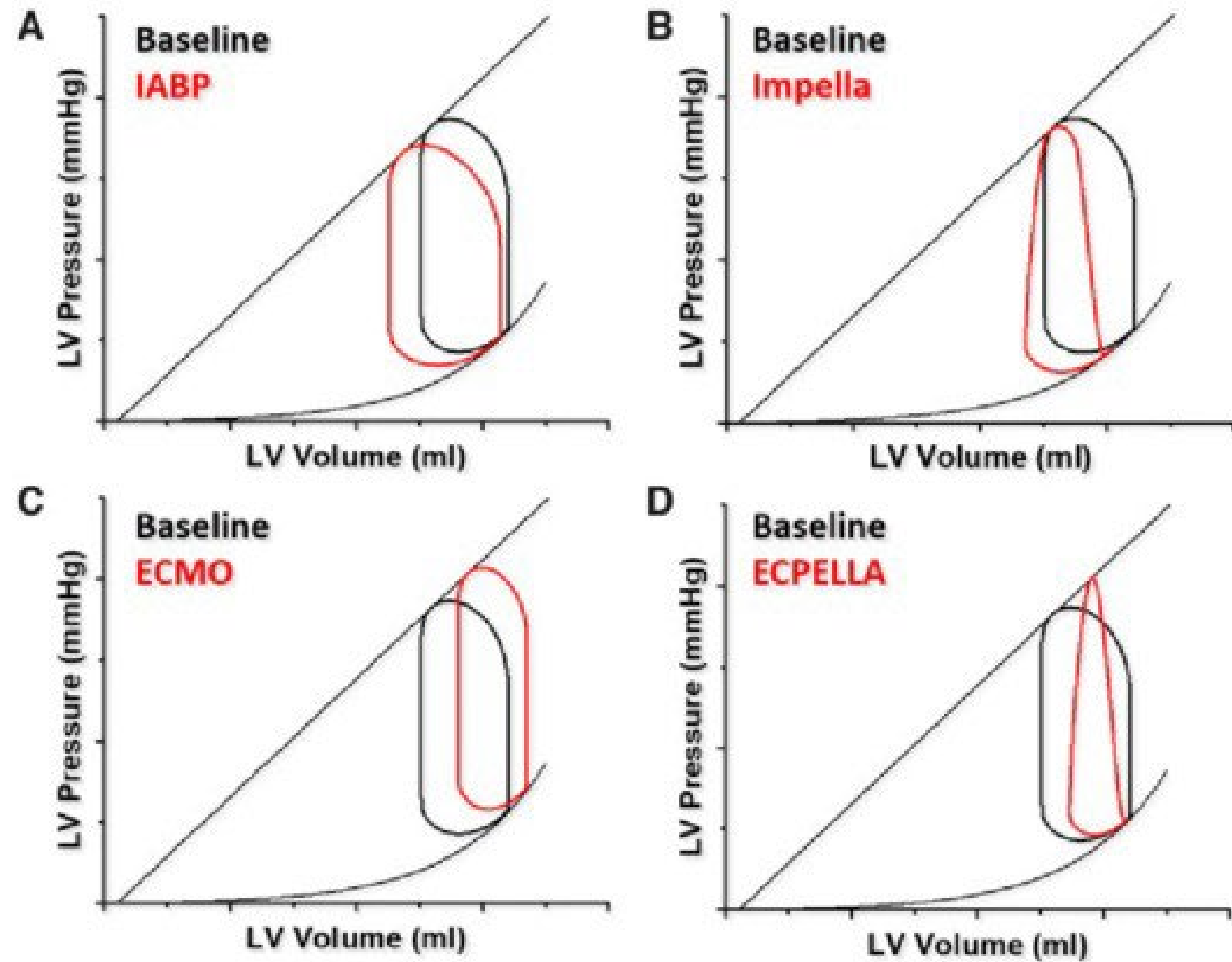




# Tratamiento



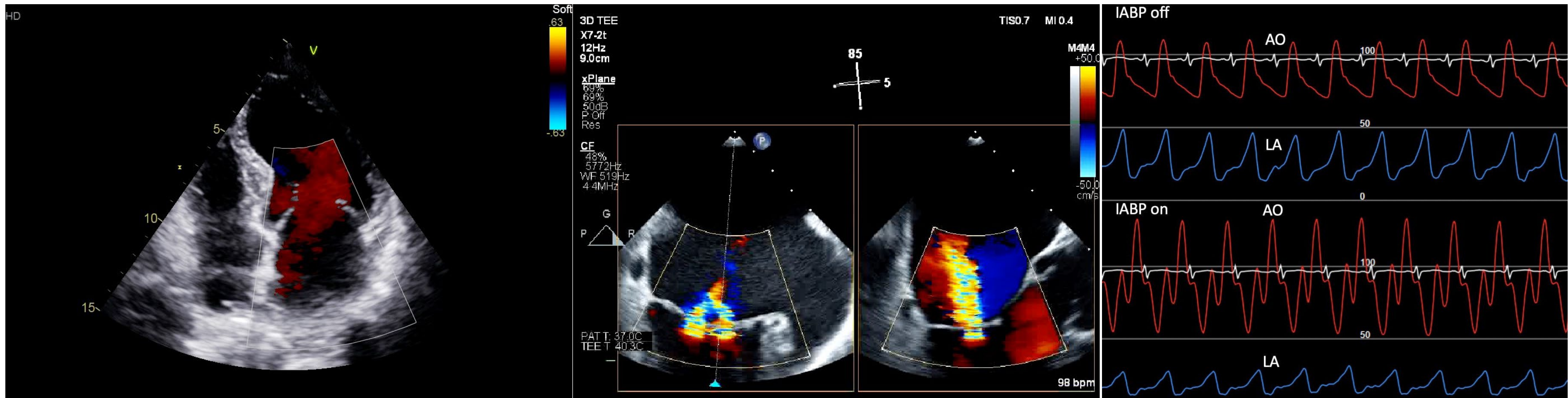
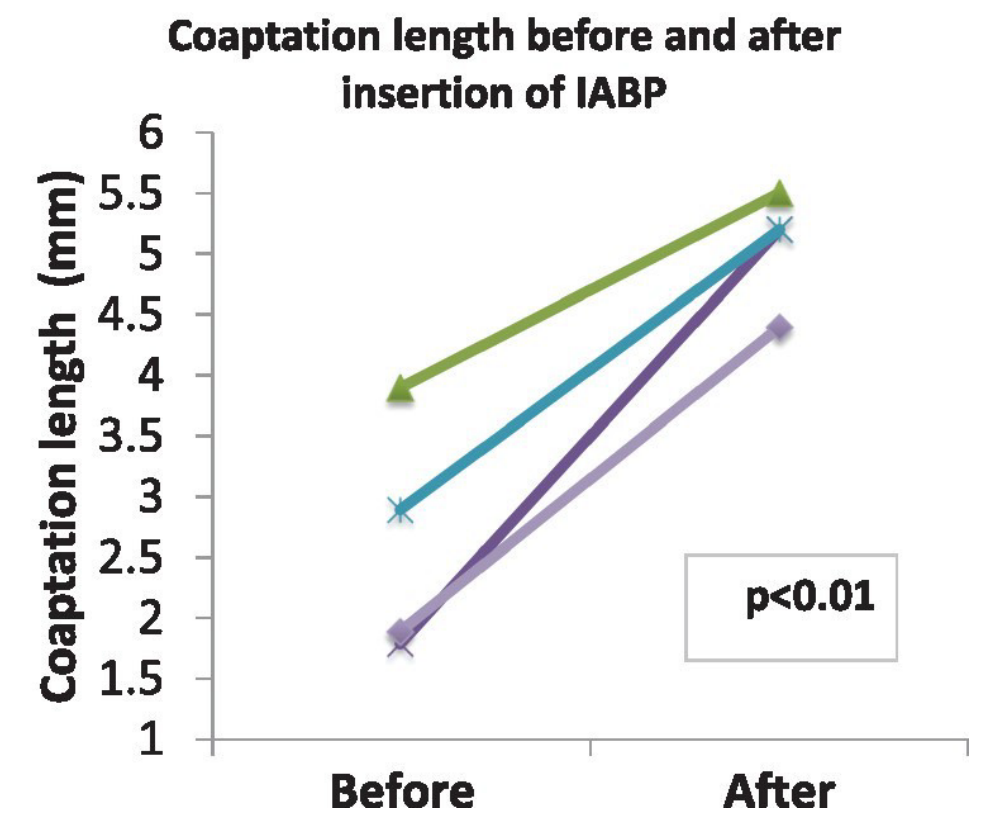
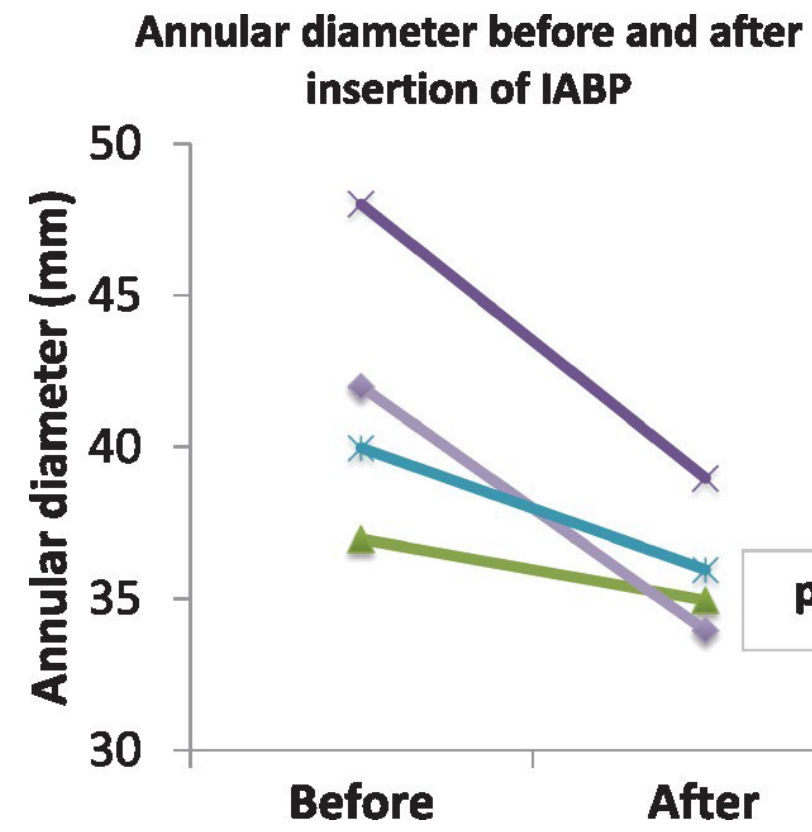
# Tratamiento: Soporte circulatorio mecánico



# Tratamiento: IABP

Routine intra-aortic balloon pumping is not indicated. <sup>177,437</sup>

“Routine IABP counterpulsation cannot be recommended, but may be considered for haemodynamic support in selected patients (i.e. severe mitral insufficiency or ventricular septal defect).”





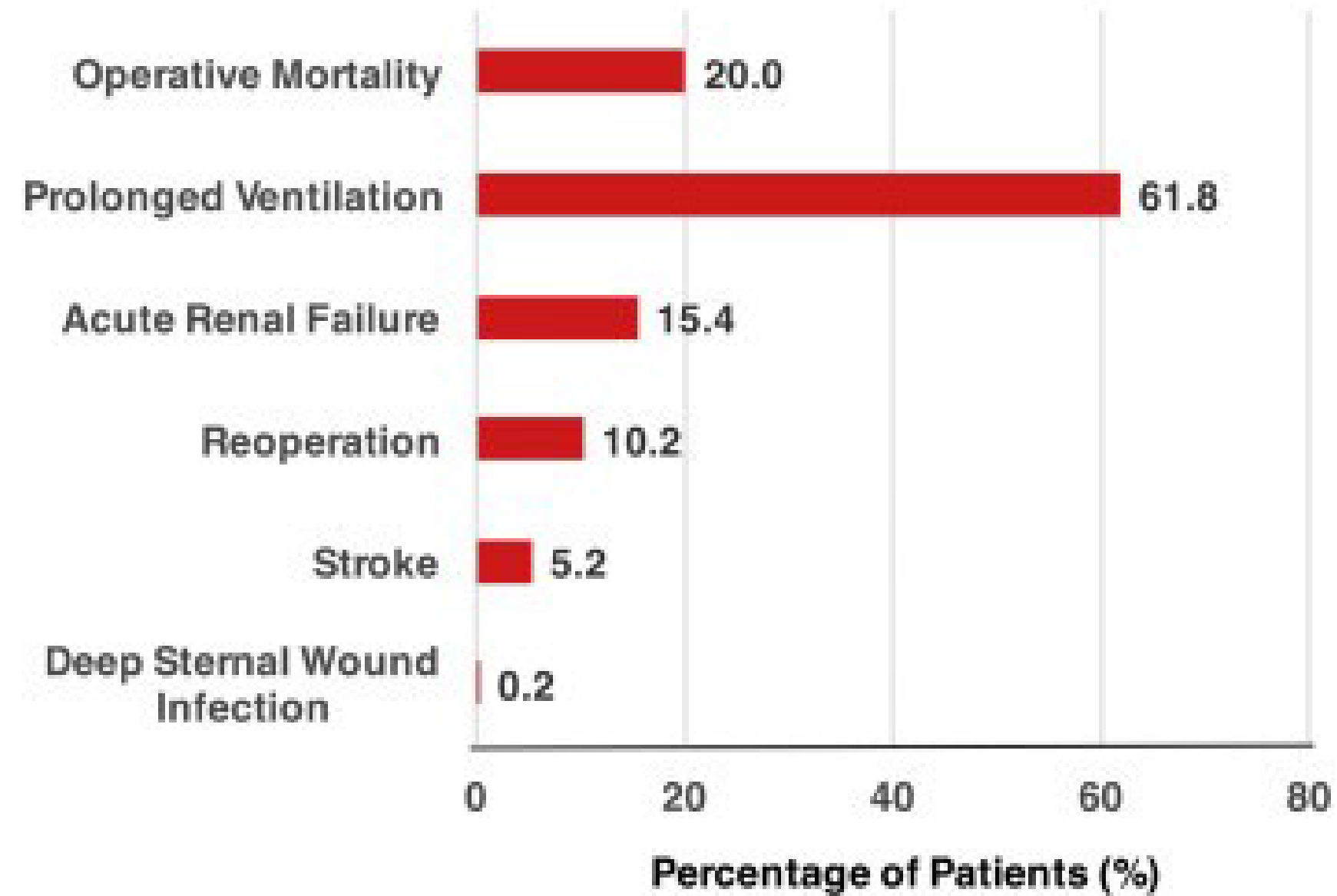
**TABLE 3. Multivariable predictors of hemodynamic response to intra-aortic balloon pump therapy.**

Variable	Odds Ratio	95% Confidence Interval	P-Value
Heart rate >90 bpm	1.52	0.79-2.96	.21
Systemic vascular resistance >1300 dynes/sec/cm <sup>-5</sup>	5.04	1.86-13.6	<.01
Pulse pressure >30 mm Hg	1.07	0.55-2.07	.84
Right atrium to pulmonary artery diastolic pressure <0.60	1.30	0.66-2.56	.45
Moderate to severe mitral regurgitation	2.42	1.25-4.66	<.01

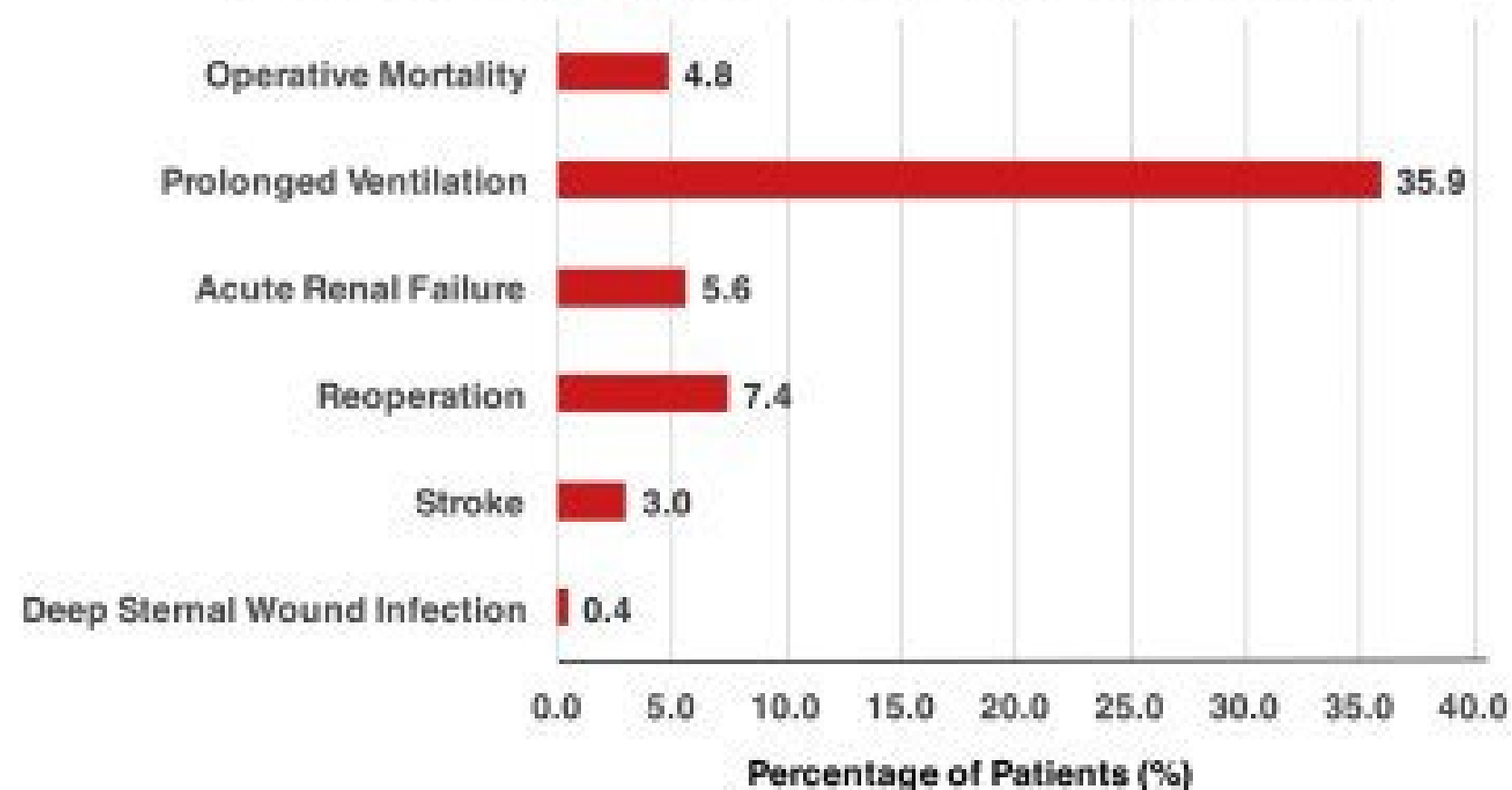
# Tratamiento: cirugía

- Registro STS: 2011 – 2018
- N = 1342

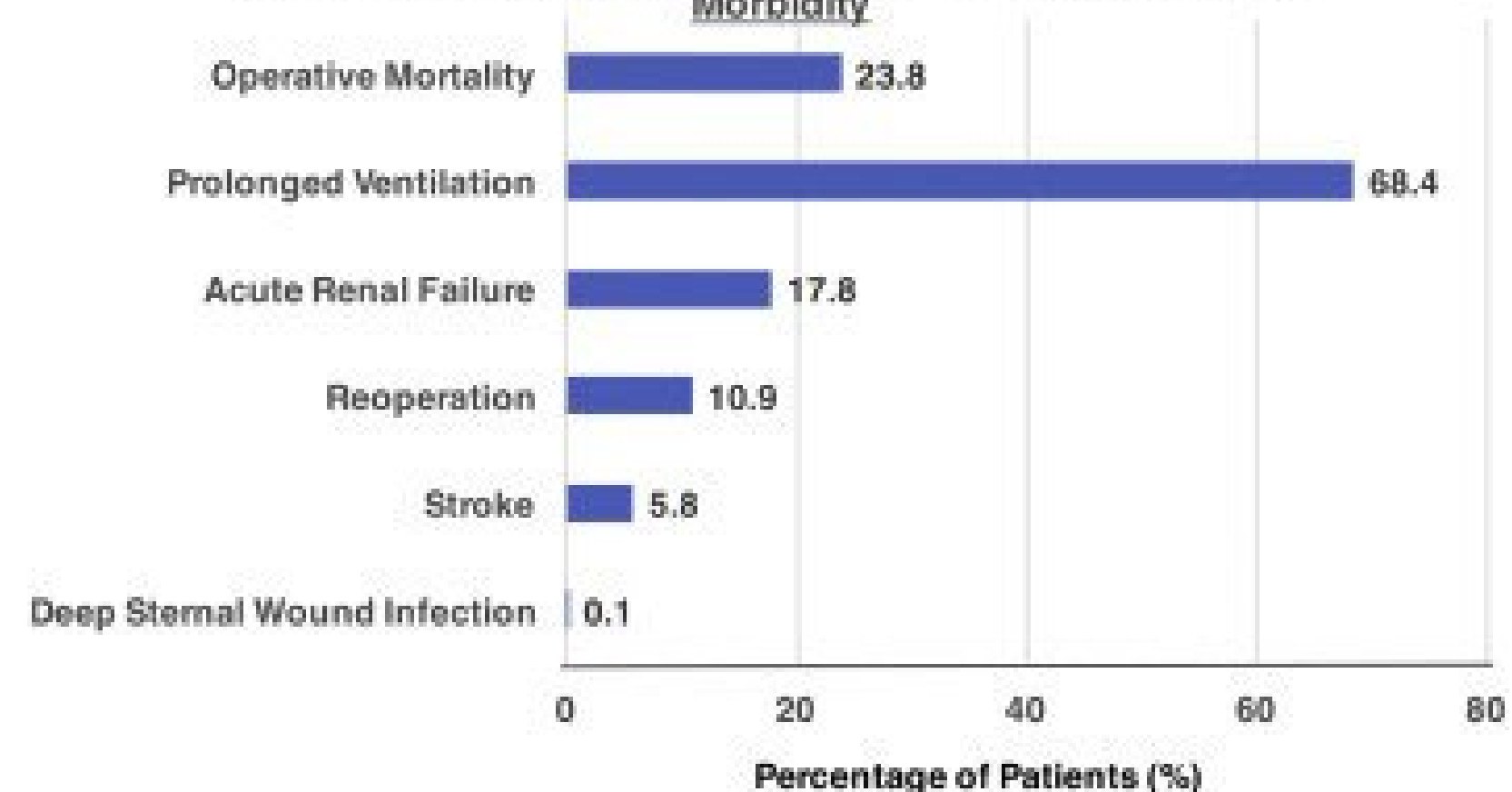
## Operative Mortality and Major Morbidity



**Mitral Valve Repair: Operative Mortality and Major Morbidity**



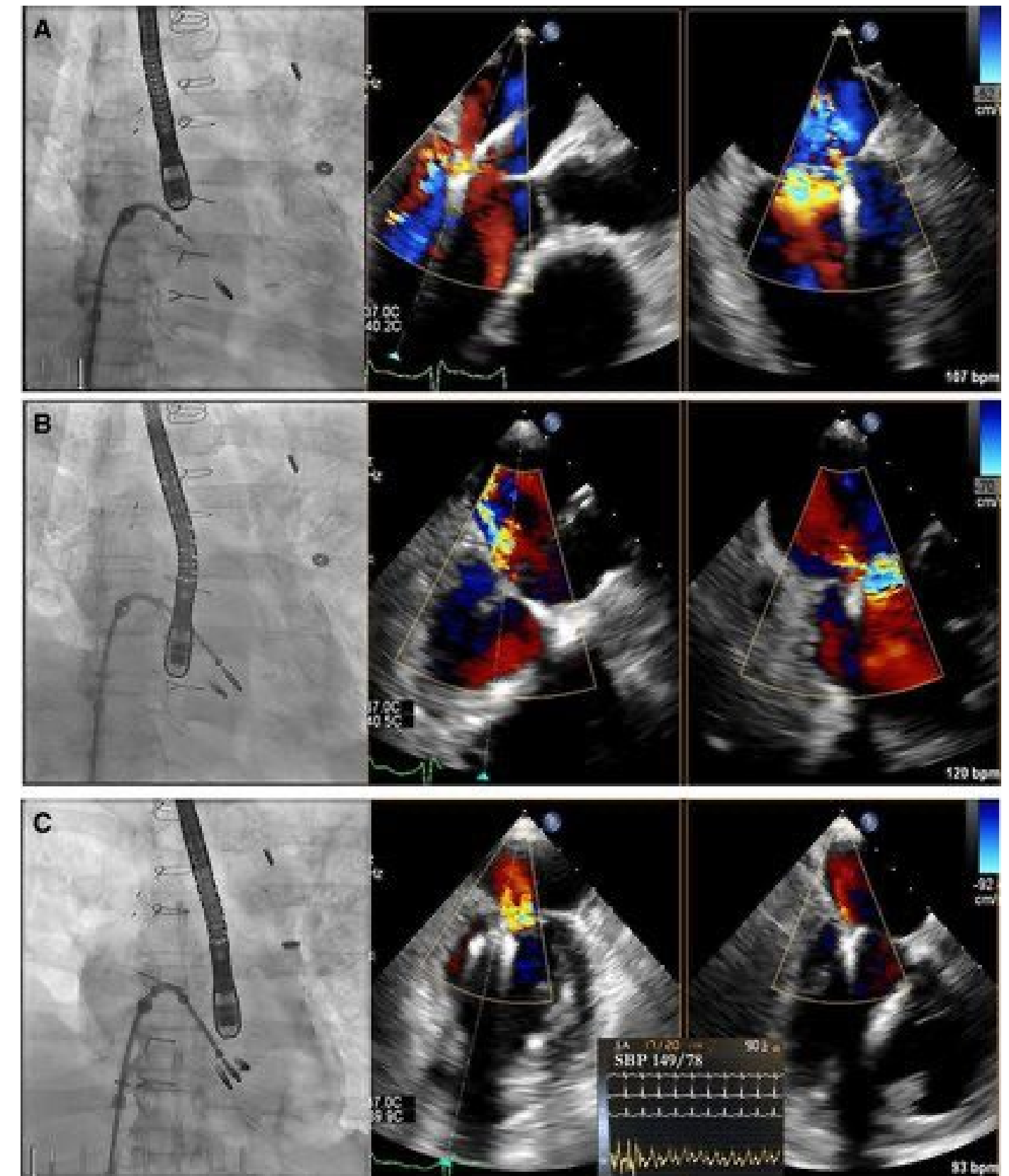
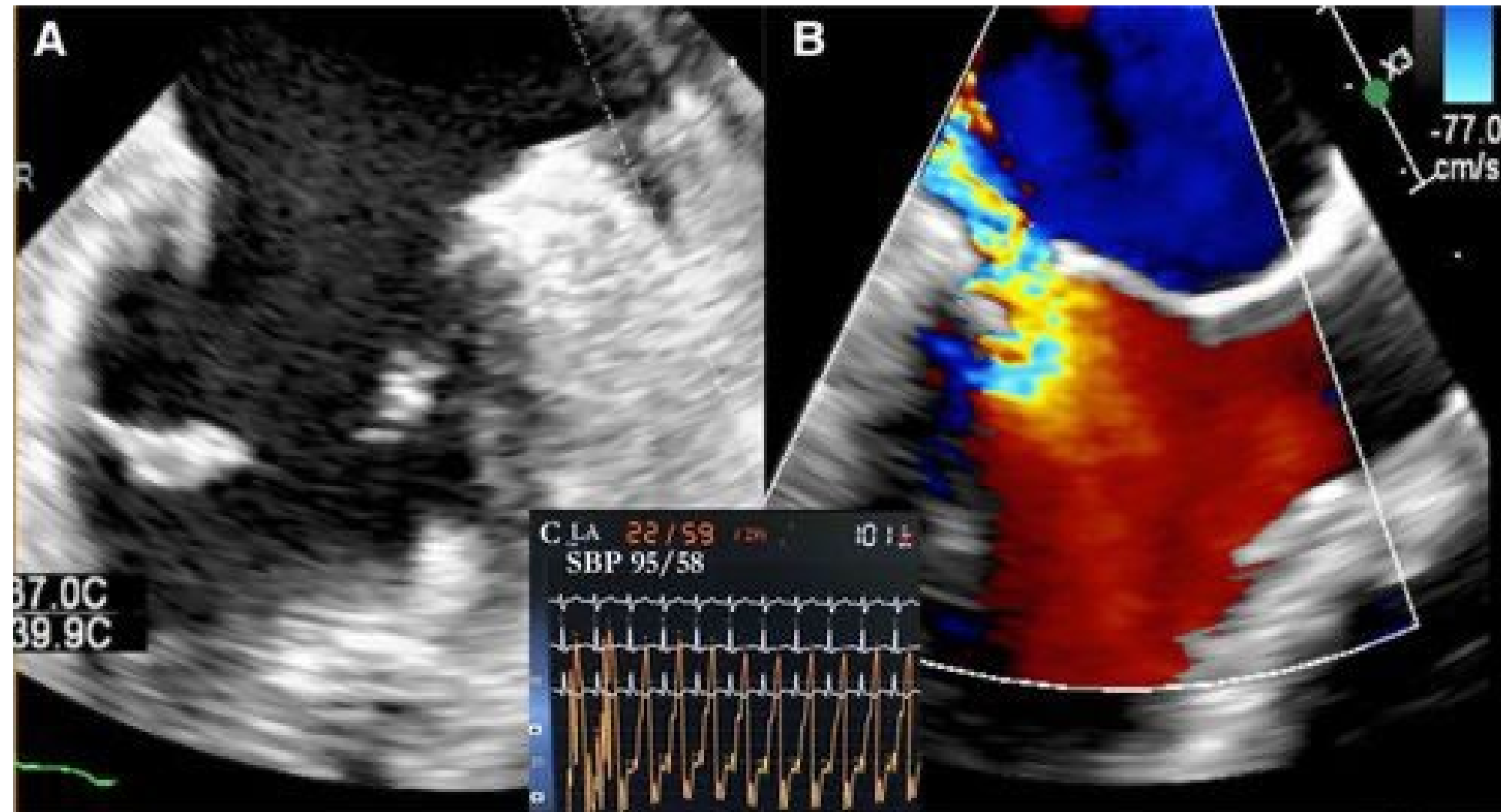
**Mitral Valve Replacement: Operative Mortality and Major Morbidity**



Operative urgency	<b>Repair (271)</b>	<b>Replacement (1071)</b>	<.001
Elective	71 (26.3%)	50 (4.7%)	
Urgent	153 (56.7%)	369 (34.5%)	
Emergent	42 (15.6%)	554 (51.7%)	
Emergent salvage	4 (1.5%)	98 (9.2%)	
Cardiogenic shock	52 (19.3%)	706 (65.9%)	<.001
Preoperative mechanical assistance			
Intraaortic balloon pump	71 (26.3%)	693 (64.7%)	<.001
Impella	0	55 (5.1%)	<.001
Extracorporeal membrane oxygenation	2 (0.7%)	39 (3.6%)	.01



# MitraClip

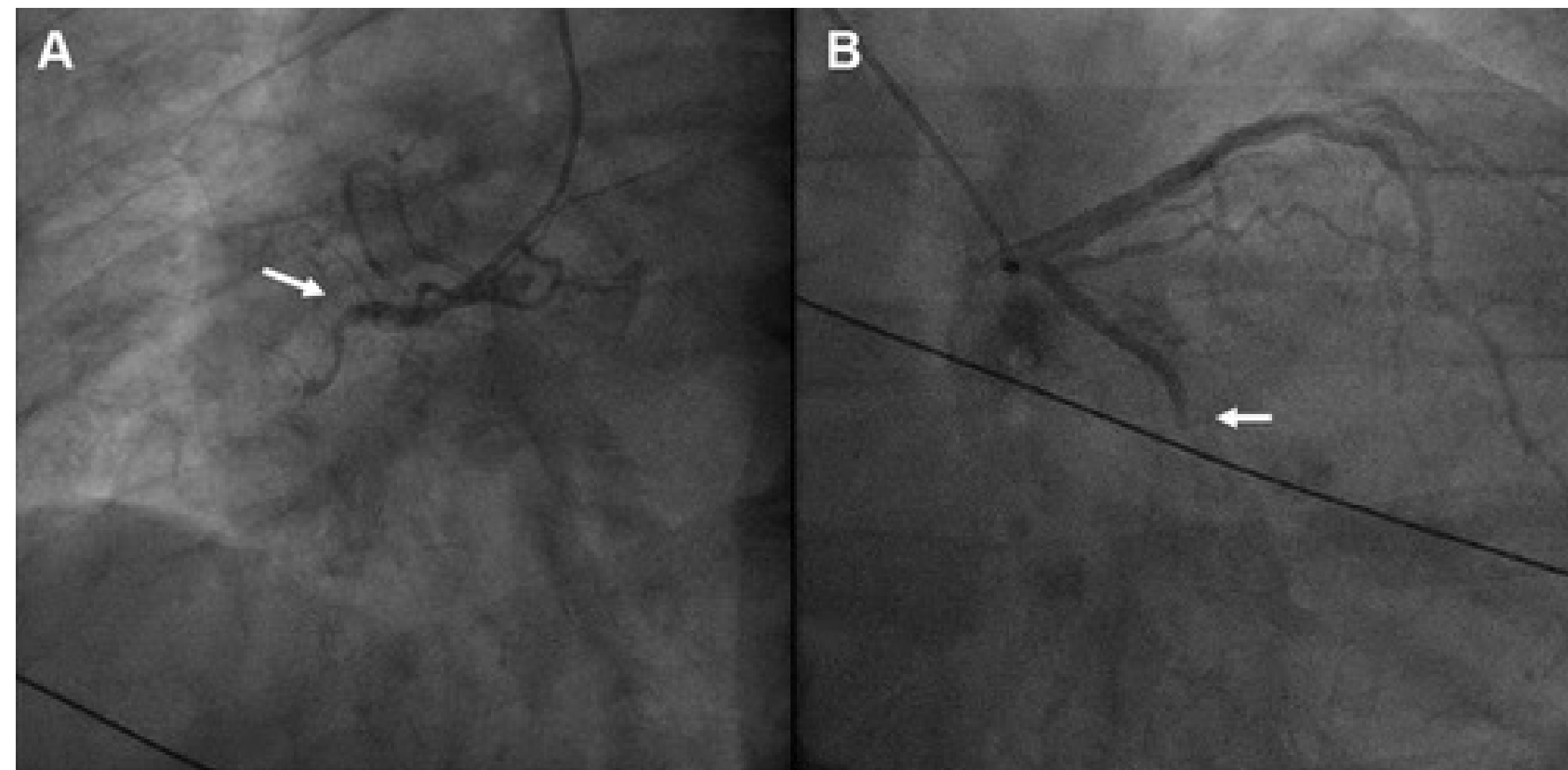
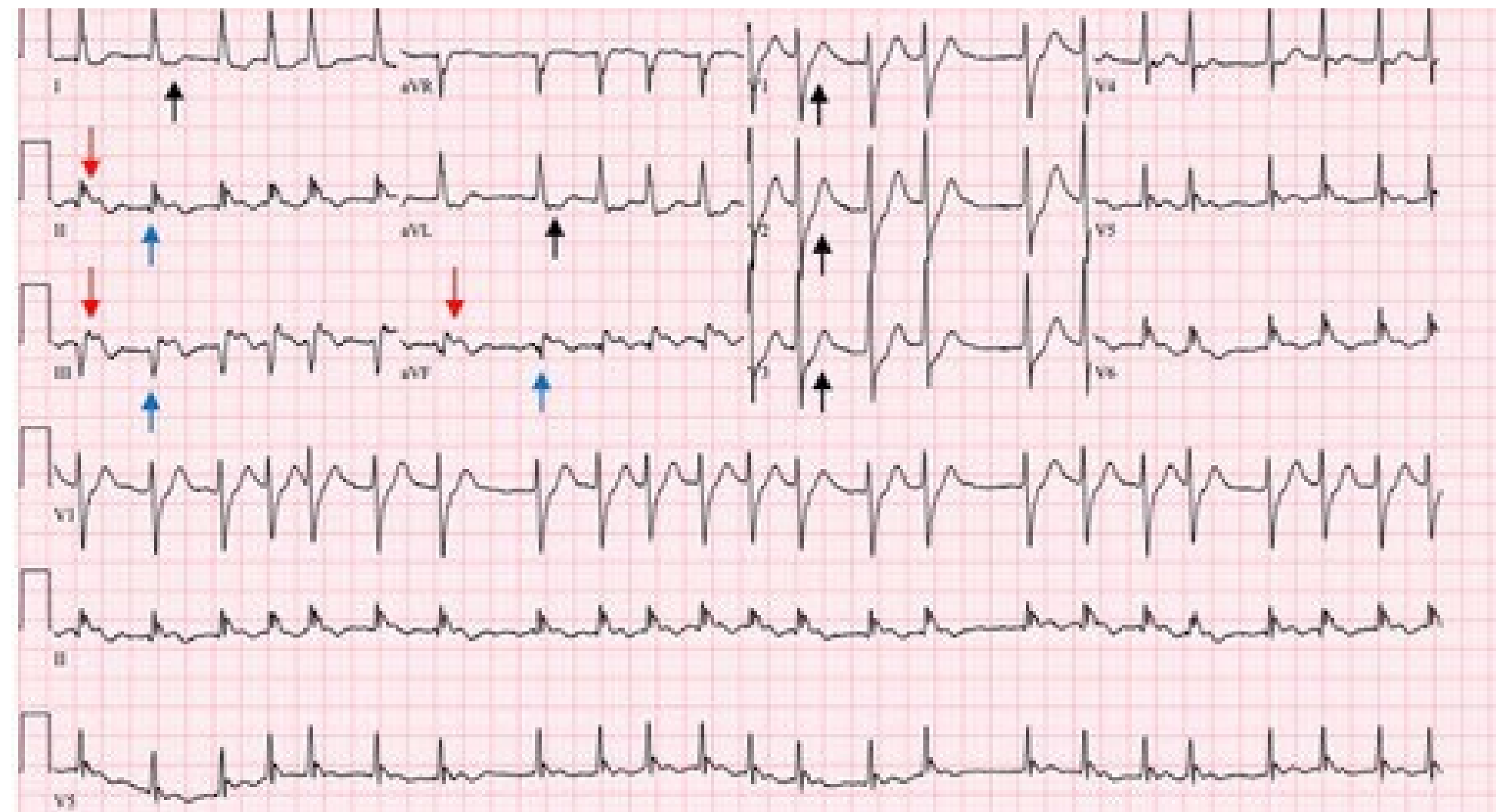


# Caso rotura músculo papilar

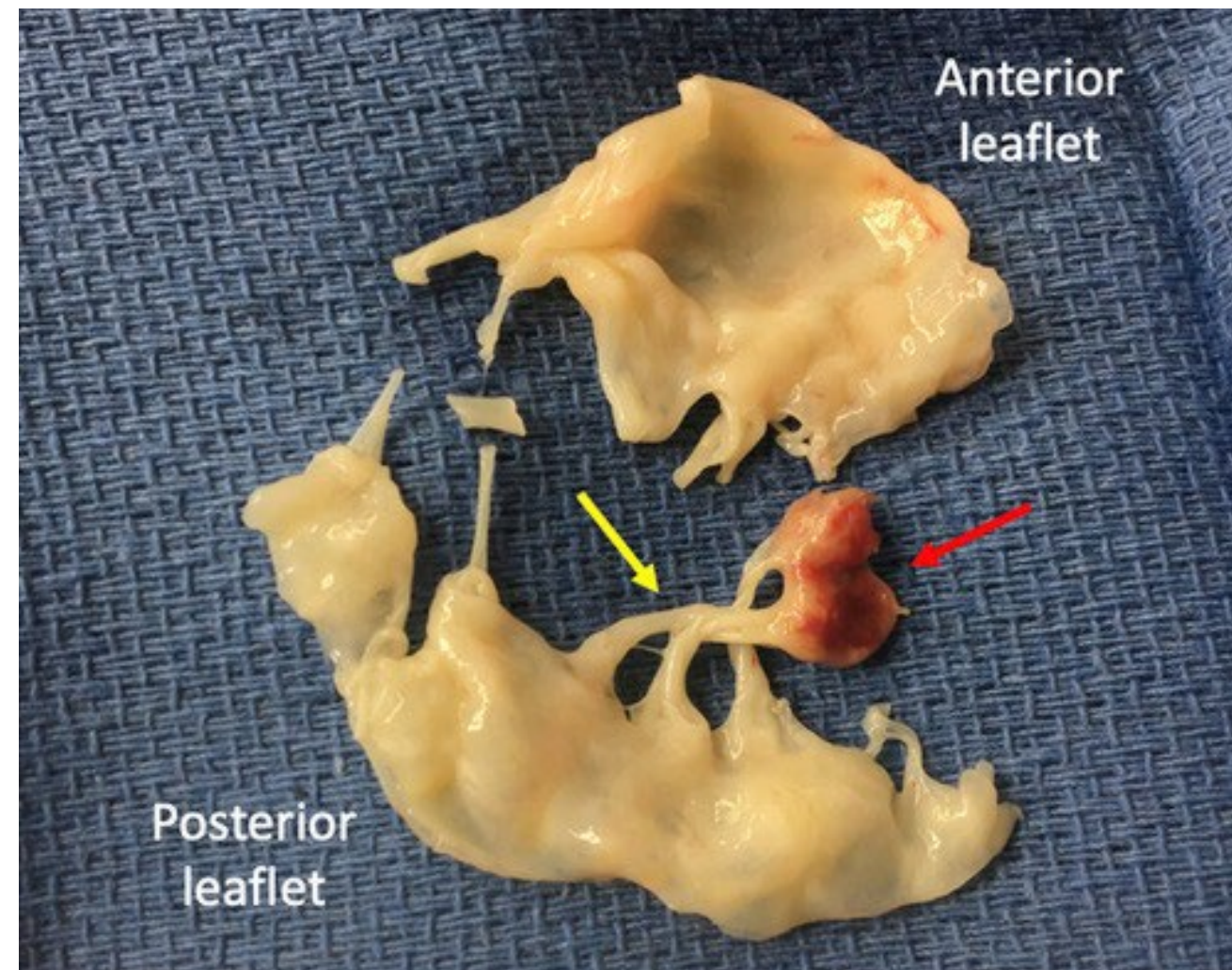
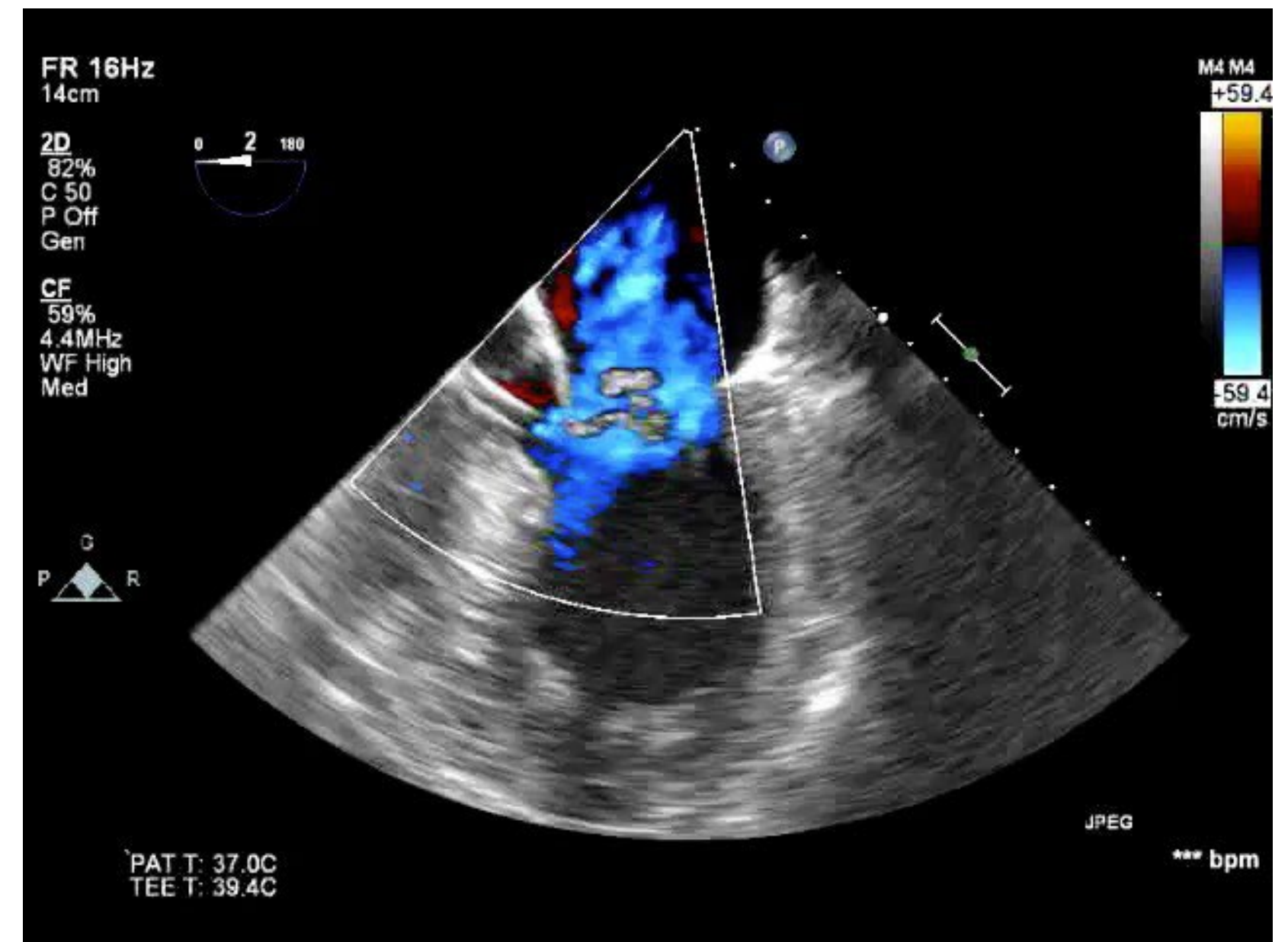
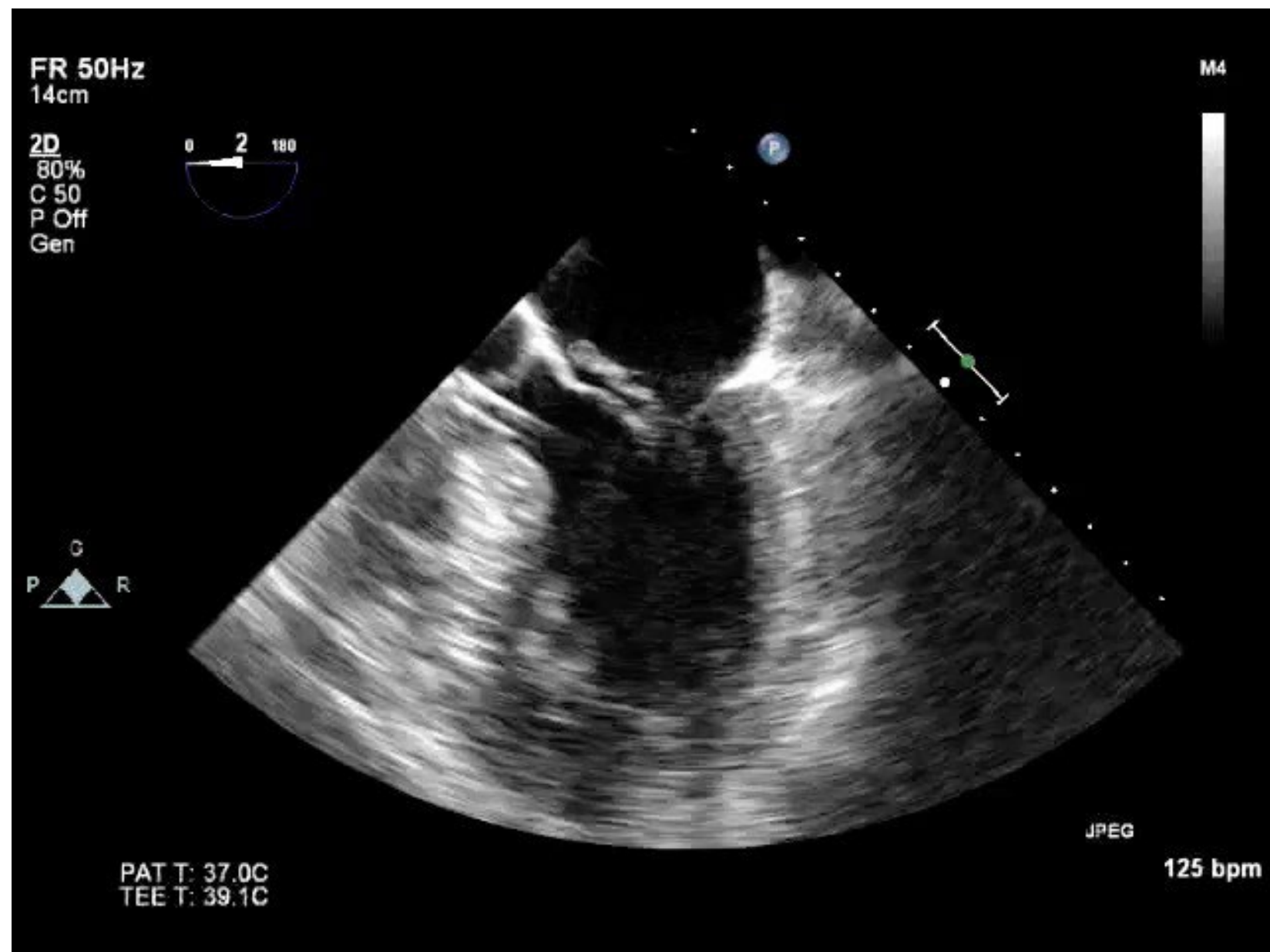
Varón de 52 años.

Dolor torácico de 1 hora > hipotensión, taquicardia e insuficiencia respiratoria

No soplos







# Baja incidencia, y alta mortalidad





# Bibliografía

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