Intérêt de l’échographie d’effort dans la prise en charge des valvulopathies

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TABLE 3 Evaluation of Patients With Known or Suspected VHD

Reason	Test	Indication
Initial evaluation: All patients with known or suspected valve disease	TTE*	Establishes chamber size and function, valve morphology and severity, and effect on pulmonary and systemic circulation
	History and physical	Establishes symptom severity, comorbidities, valve disease presence and severity, and presence of HF
	ECG	Establishes rhythm, LV function, and presence or absence of hypertrophy
Further diagnostic testing: Information required for equivocal symptom status, discrepancy between examination and echocardiogram, further definition of valve disease, or assessing response of the ventricles and pulmonary circulation to load and to exercise	Chest x-ray	Important for the symptomatic patient; establishes heart size and presence or absence of pulmonary vascular congestion, intrinsic lung disease, and calcification of aorta and pericardium
	TEE	Provides high-quality assessment of mitral and prosthetic valve, including definition of intracardiac masses and possible associated abnormalities (eg, intracardiac abscess, LA thrombus)
	CMR	Provides assessment of LV volumes and function, valve severity, and aortic disease
	PET CT	Aids in determination of active infection or inflammation
	Stress testing	Gives an objective measure of exercise capacity
	Catheterization	Provides measurement of intracardiac and pulmonary pressures, valve severity, and hemodynamic response to exercise and drugs

ACC guidelines Otto, J Am Coll Cardiol 2021

Exercise echocardiography is used for the assessment of LV global and segmental function, pulmonary artery pressure, and aortic and mitral pressure gradients.[101,107] It also documents exercise-induced increase of MR and TR severity, especially in patients with secondary disease.[108,109] Prognostic impact has been shown mainly for AS and MR.[110,111] Misconceptions regarding its risk and tolerability contribute to the overall underuse of exercise testing in patients with VHD,[12] despite data confirming its safety in most asymptomatic patients.[112,113]

ESC guidelines Praz Eur Heart J 2025

EE patients asymptomatiques FEVG conservée

• Very severe AS (mean gradient ≥60 mmHg or V_{max} >5.0 m/s).[14,362,363,482–484] • Severe valve calcification (ideally assessed by CCT) and V_{max} progression ≥0.3 m/s/year.[303,353,364] • Markedly elevated BNP/NT-proBNP levels (more than three times age- and sex-corrected normal range, confirmed on repeated measurement without other explanation).[97,365] • LVEF <55% without another cause.[14,354,356–359]	IIa	B
Intervention should be considered in asymptomatic patients with severe AS and a sustained fall in BP (>20 mmHg) during exercise testing.	IIa	C

Esc guidelines 2025

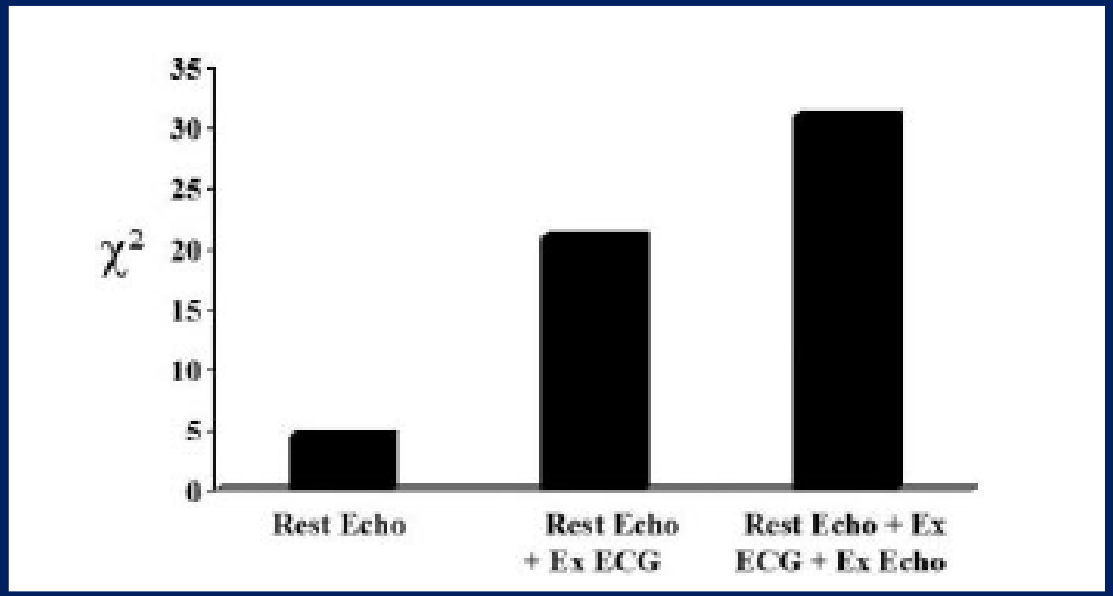
Si EE normale … validité 6 mois

2a	B-NR	6. In apparently asymptomatic patients with severe AS (Stage C1) and low surgical risk, AVR is reasonable when an exercise test demonstrates decreased exercise tolerance (normalized for age and sex) or a fall in systolic blood pressure of ≥10 mm Hg from baseline to peak exercise (13,28-30).

ACC guidelines Otto, J Am Coll Cardiol 2021

RAC avec FEVG conservée : valeur ajoutée de l'échographie d'effort?

69 patients RAC serré asymptomatiques



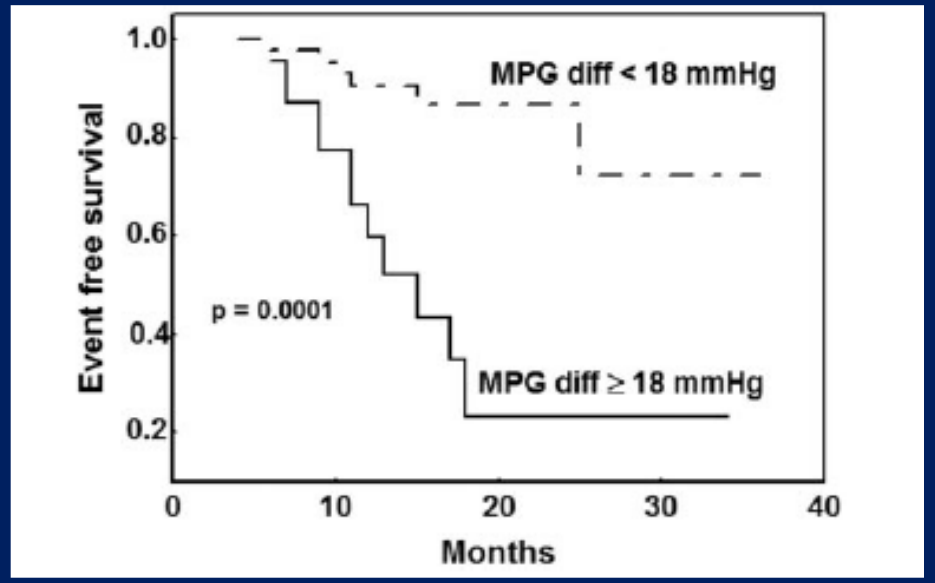


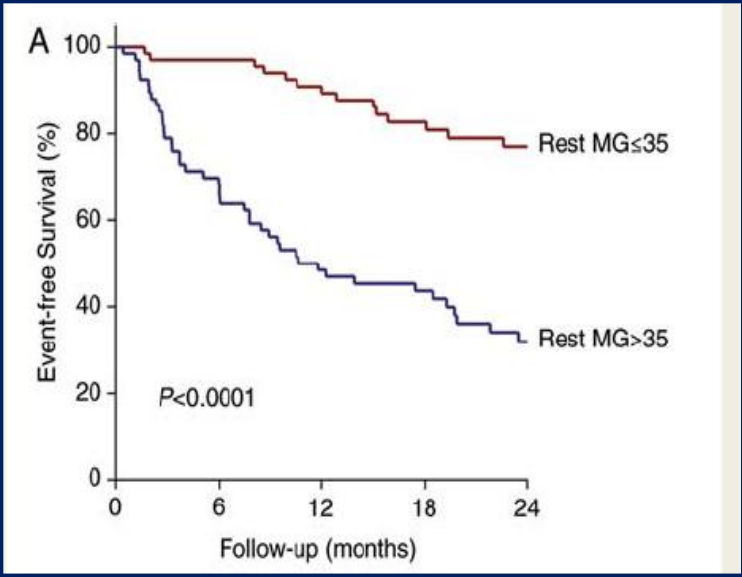
TABLE 3. Multivariate Predictors of Events

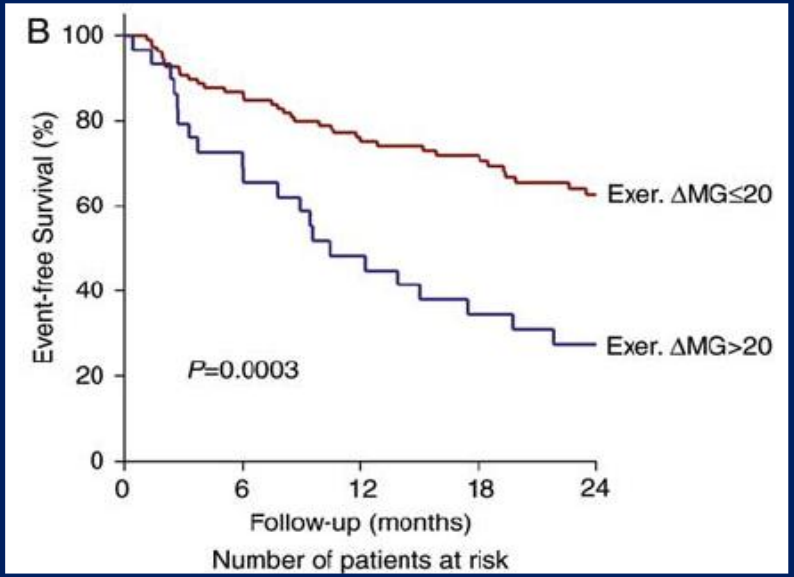
Categorical Variables	χ	*P* Value
Mean aortic pressure gradient diff ≥18 mm Hg	10	0.015
Abnormal exercise test	9.1	0.0026
Aortic valve area <0.75 cm	8.7	0.0031

Diff indicates difference between exercise and rest.

Limitations : décision opératoire ; prise par le praticien

Lancelotti P, circulation 2005





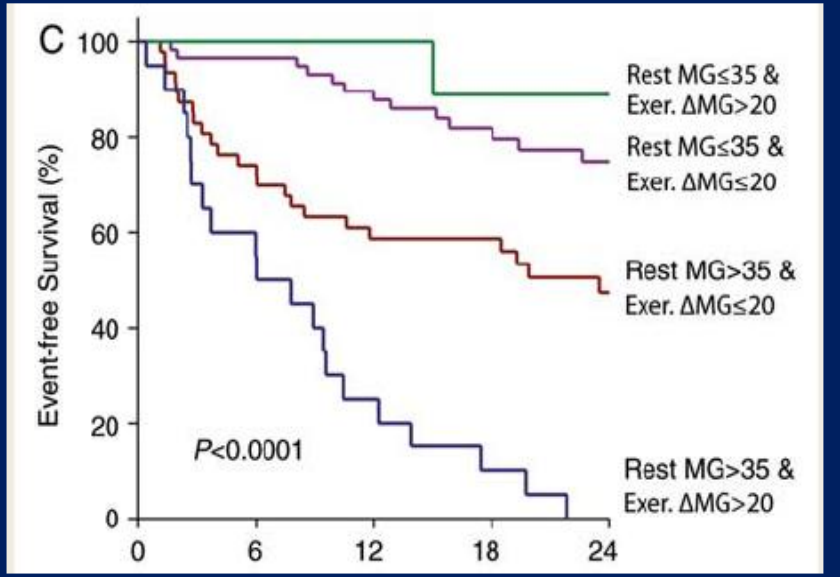


Table 4 Univariate and multivariate analysis of association between baseline variables and event risk in the whole cohort ($n = 135$) with variables entered in dichotomous format

Variables	(%) of patients with variable	Univariate analysis		Multivariate analysis	
		HR (95% CI)	*P*-value	HR (95% CI)	*P*-value
Age ≥65 years	58	2.16 (1.30–3.72)	0.003	1.96 (1.15–3.47)	0.01
Diabetes	10	2.10 (0.90–4.10)	0.08	3.20 (1.33–6.87)	0.01
Rest systolic blood pressure >135 mmHg	55	1.71 (0.78–2.85)	0.03	1.30 (0.78–2.23)	0.32
LV hypertrophy	41	1.90 (1.17–3.08)	0.009	1.96 (1.17–3.27)	0.01
Rest mean gradient >35 mmHg	50	3.70 (2.21–6.41)	<0.0001	3.60 (2.11–6.37)	<0.0001
Exercise Δ mean gradient >20 mmHg	21	2.10 (1.22–2.52)	0.008	3.83 (2.16–6.67)	<0.0001
Exercise LV ejection fraction <70%	38	1.61 (1.00–2.62)	0.05	1.61 (0.95–2.71)	0.07

Marechaux, Eur Heart J 2010

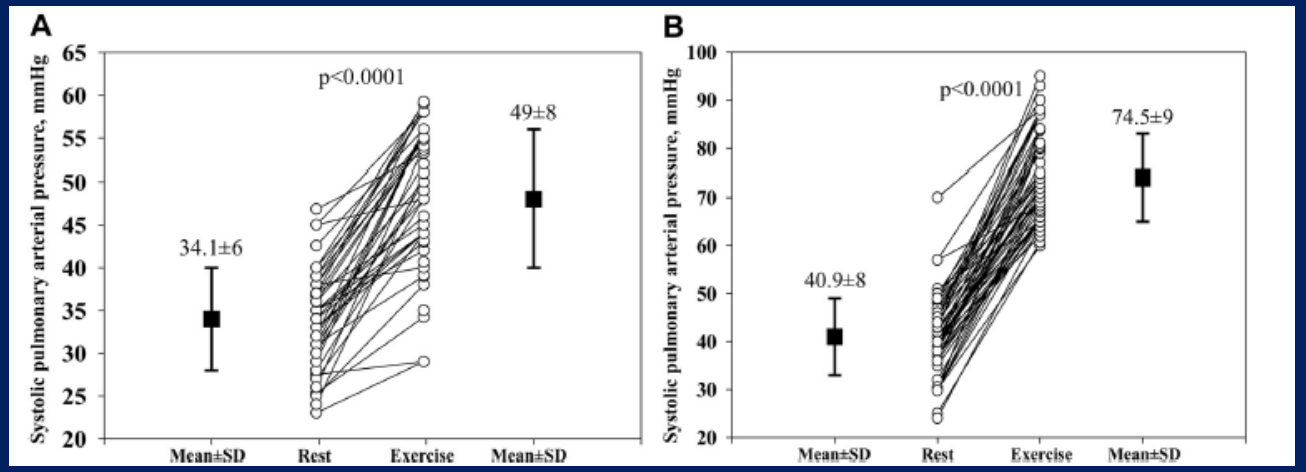
- 186 patients RAC asympto sce< 1,5cm2, 51 patients EE + exclus
- 135 patients suivi 24 mois (20± 14 mois) 67 evts
  - 58 : Symptômes puis chir : 58 pts
  - 4 : symptômes non opéré comorbidités++… 3 deces
  - 1 arrêt CR ressuscité puis opéré
  - 3 décès 20, 31 et 50 mois

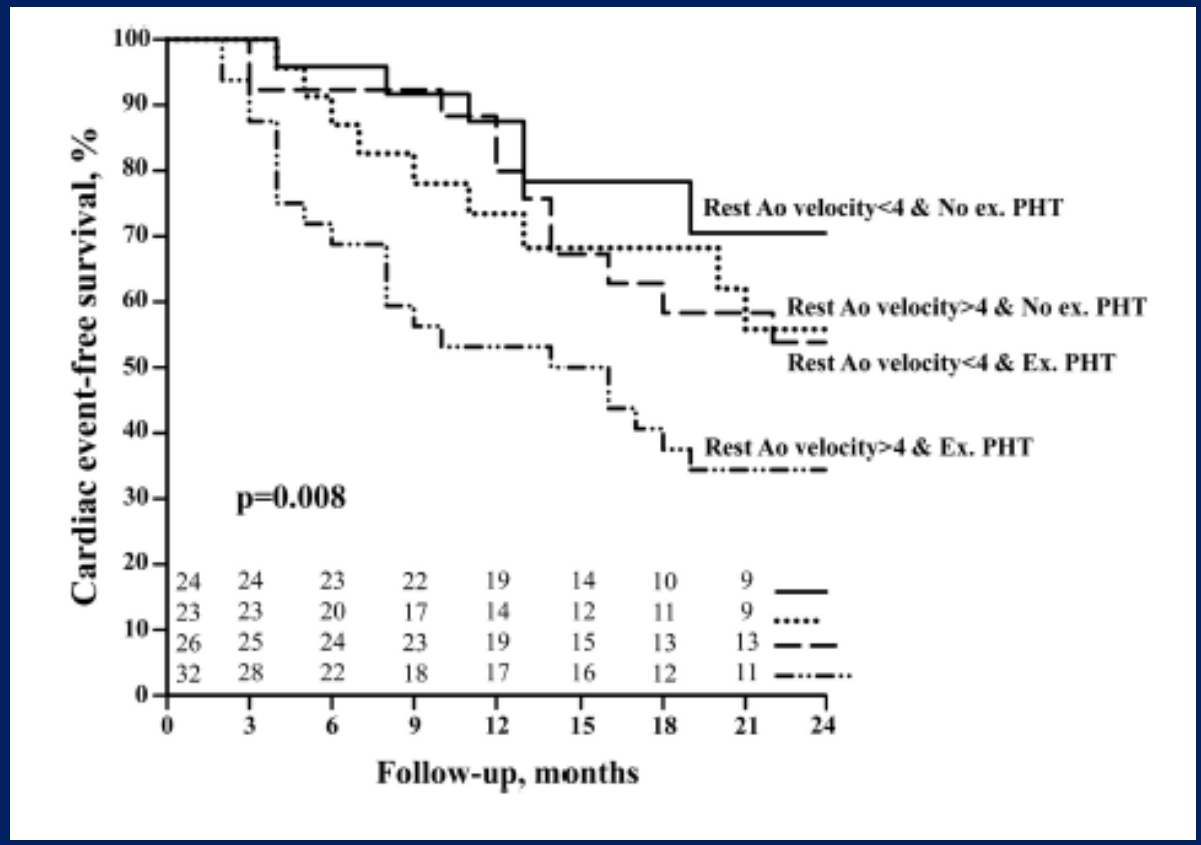
Marechaux, Eur Heart J 2010

RAC et HTAP d'effort

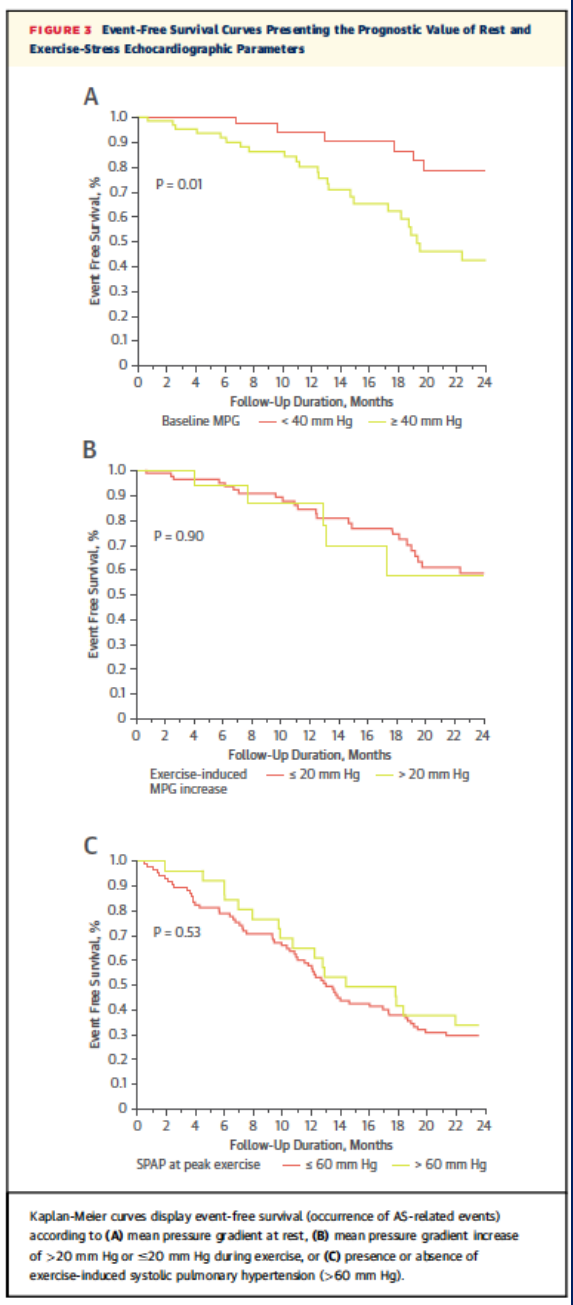
105 pts RAC <0.6cm2/m2 FEVG conservée test d'effort normal PAPs > 60 mmHg .. 58 patients

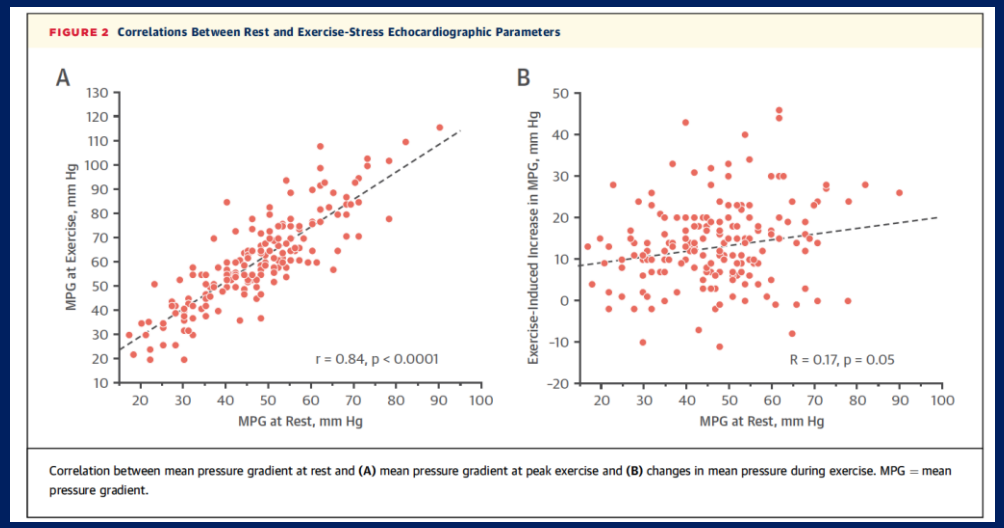
Suivi 19 mois 49 evts
7 DC….
42 apparition de symptômes





Lancelotti circulation 2012





148 patients dont 112 avec EE normale

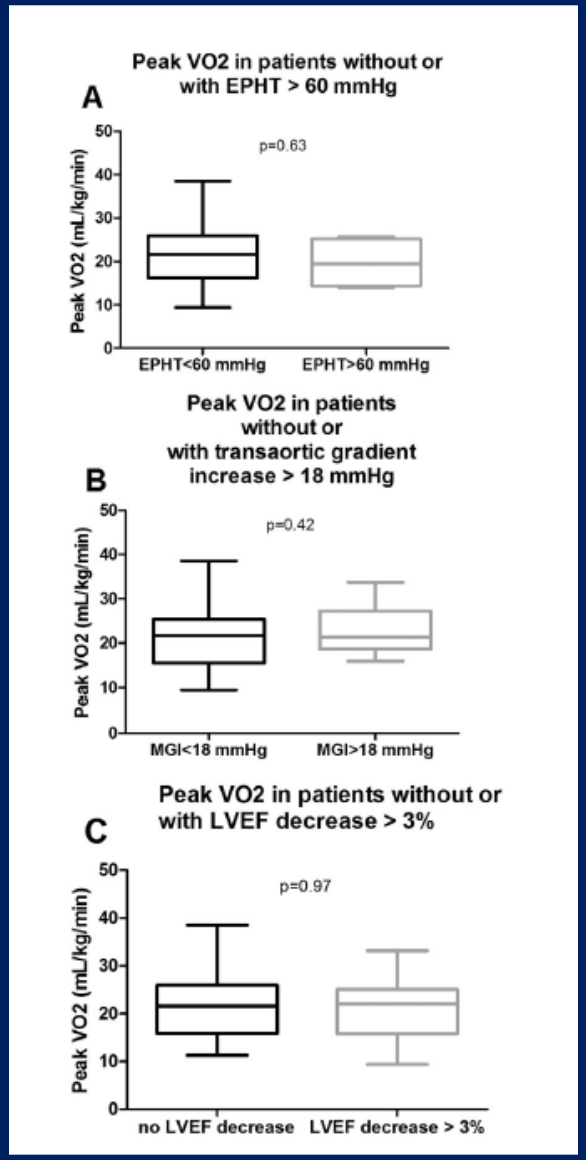
Bonne corrélation GM repos et effort
Pas de valeur pronostique
élévation du gradient >20mmhgou de la PAPs>60mmHg

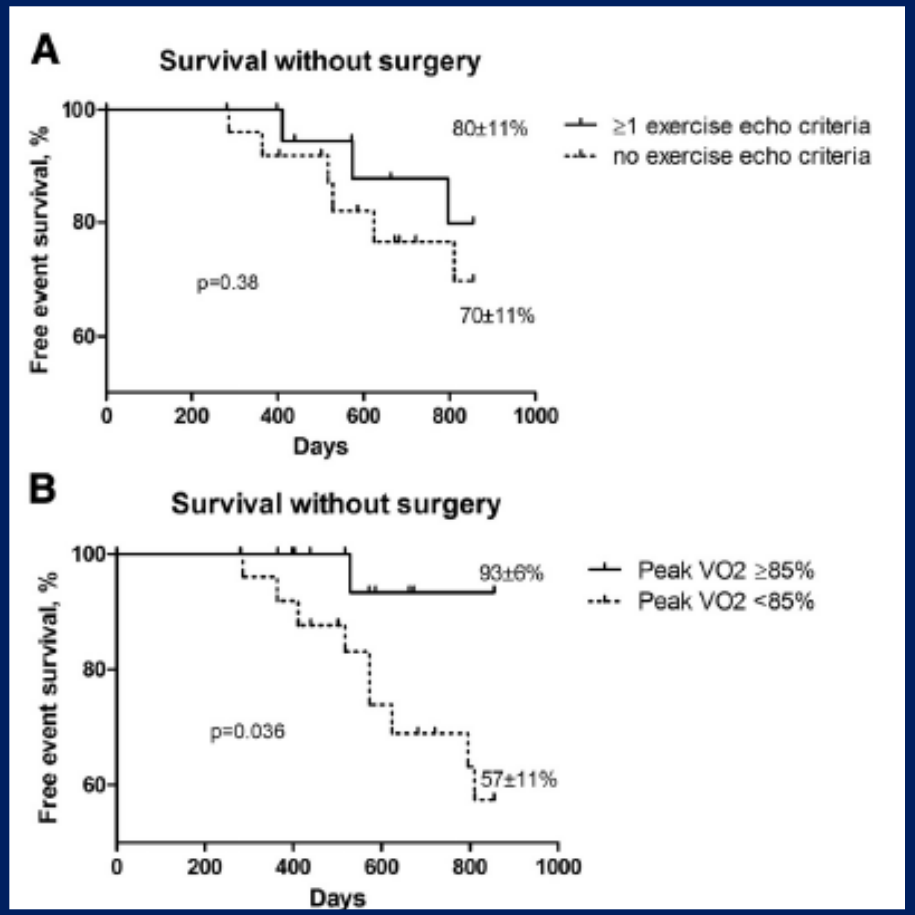
Goubelaire Meissika Zeitoun, JACC imaging 2018

RAC asymptomatique FEVG conservée

- EE+ : intervention
- EE- mais echo elevation du gradient > 18-20 mmHg ou, ou HTAP… prédictif de symptômes… surveillance rapprochée

54 pts RAC asympto FEVG>50% : CPX et echo d'effort





Domanski O, Int J Cardiol 2017

A CPET, or if unavailable an ET, should be considered in asymptomatic patients with severe aortic stenosis in order to stratify therapeutic option in case of abnormalities (reduction in VO_2 peak, exercise angina, decrease or increase of systolic blood pressure < 20 mm Hg, ST-segment depression, or ventricular arrhythmia) [18][19][20].
IIa B

A CPET, or, if unavailable, an ET should be considered when the clinical picture does not match echocardiographic findings in the context of other valvular disease than aortic stenosis.
IIa C
An ET is not recommended in symptomatic severe valvular aortic stenosis [18]
III B

Guidelines EHJ 2017

Predictors of symptom development and adverse outcomes in asymptomatic patients include clinical characteristics (older age, atherosclerotic risk factors), echocardiographic parameters (valve calcification, peak jet velocity[189,190]), LVEF, rate of haemodynamic progression,[189] increase in mean gradient >20 mmHg with exercise,[172] severe LV hypertrophy,[191] indexed stroke volume,[158] LA volume,[192] LV global longitudinal strain,[26,168,193] and abnormal biomarker levels (natriuretic peptides, troponin, and fetuin-

Guidelines EHJ 2021

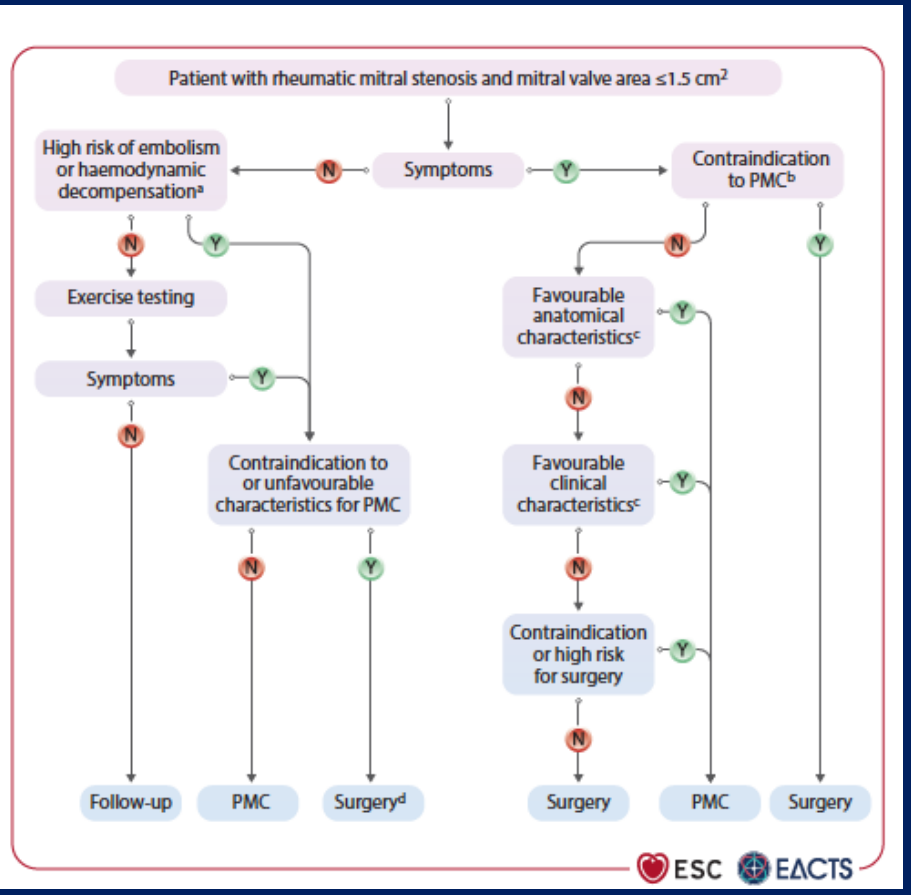
Table 7 Exercise test indications in the context of valvular diseases.	
A CPET (or, if unavailable, an ET) should be considered in asymptomatic patients with severe aortic stenosis, to orient the therapeutic decision, given the occurrence of certain abnormalities (e.g. a reduction in VO_2 peak, exercise angina, a reduction or < 20 mmHg increase in systolic BP or ventricular arrhythmia) [19–21]	IIa B
A CPET (or, if unavailable, an ET) should be considered when the clinical picture does not match echocardiographic findings in the context of valvular disease, other than aortic stenosis	IIa C
An ET is not recommended in symptomatic severe aortic stenosis [19]	III B

BP: blood pressure; CPET: cardiopulmonary exercise test; ET: exercise test.

Marcadet D, in press ACVD 2018

Rétrécissement mitral

- RM serré symptomatique : pas d'indication :
- RM serré (sce<1cm2, GM>10mmHg) et patient asymptomatique
- RM peu serré (sce 1-1,5cm2, GM 5-10 mmHg) et patient symptomatique
- Limites : grande variation de l'élévation du gradient en fonction de la Fc+++



Exercise testing is indicated in asymptomatic patients or patients with symptoms that are equivocal or discordant with the severity of stenosis. Exercise echocardiography provides additional information on exercise capacity and related changes in mitral gradient and pulmonary artery pressure, and is preferred over DSE, especially when there are contraindications to dobutamine.[654] Transoesophageal echocardi-

ESC/EACTS guidelines Eur Heart J 2025

COR	LOE	RECOMMENDATION
1	C-LD	1. In patients with rheumatic MS and a discrepancy between resting echocardiographic findings and clinical symptoms, exercise testing with Doppler or invasive hemodynamic assessment is recommended to evaluate symptomatic response, exercise capacity, and the response of the mean mitral gradient and pulmonary artery pressure (1-5).

ACC guidelines Otto, J Am Coll Cardiol 2021

Quel est le paramètre le plus prédictif

Leavitt JL, JACC, 1991, 17 : 1520-6

PAPS d'effort > 60 mmHg

41à 61 mmHg vs 28 à 39 mmHg

gradient moyen > 15 mmHg

9 à 17 mmhg vs 5 à 8 mmHg

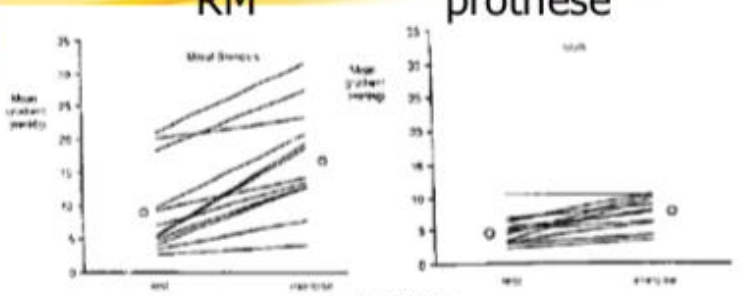
Brochet E et al JACC 2011

Evaluation à l'effort de 48 RM serrés ASF

83 % PAPS d'effort > 60 mmHg
67 % gradient moyen > 15 mmHg

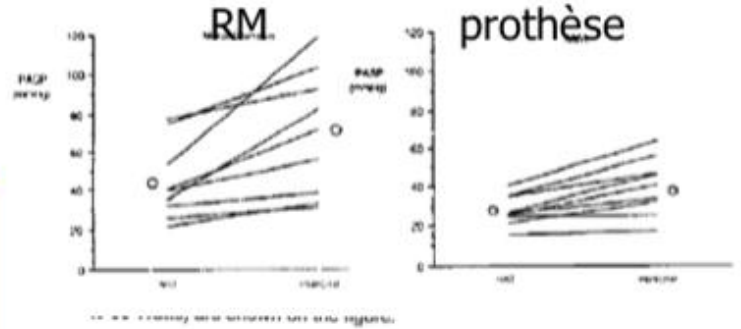
Gradient moyen

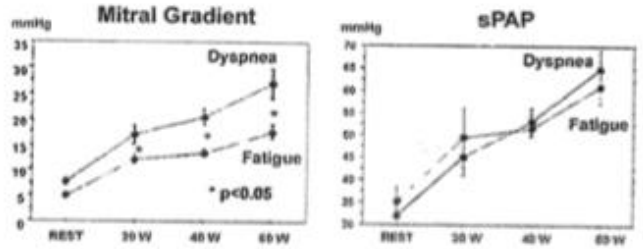
RM prothèse



PAPs

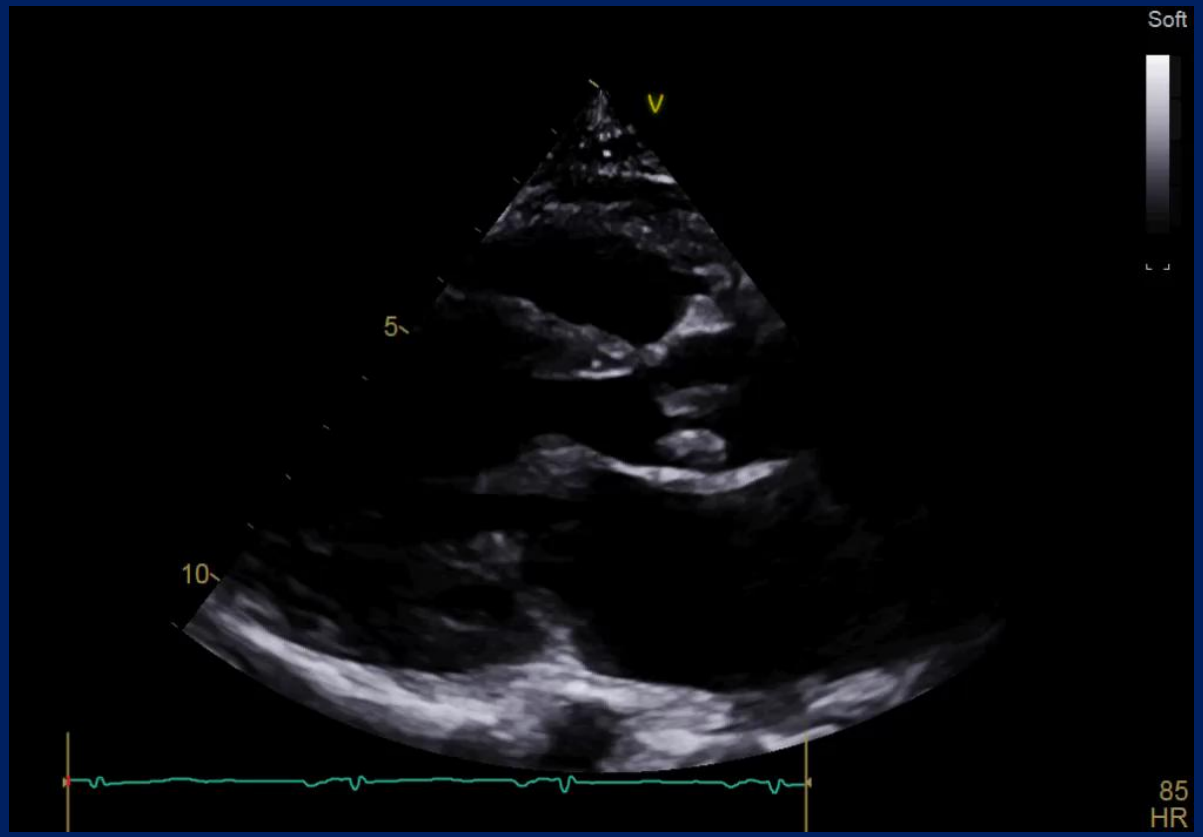
RM prothèse

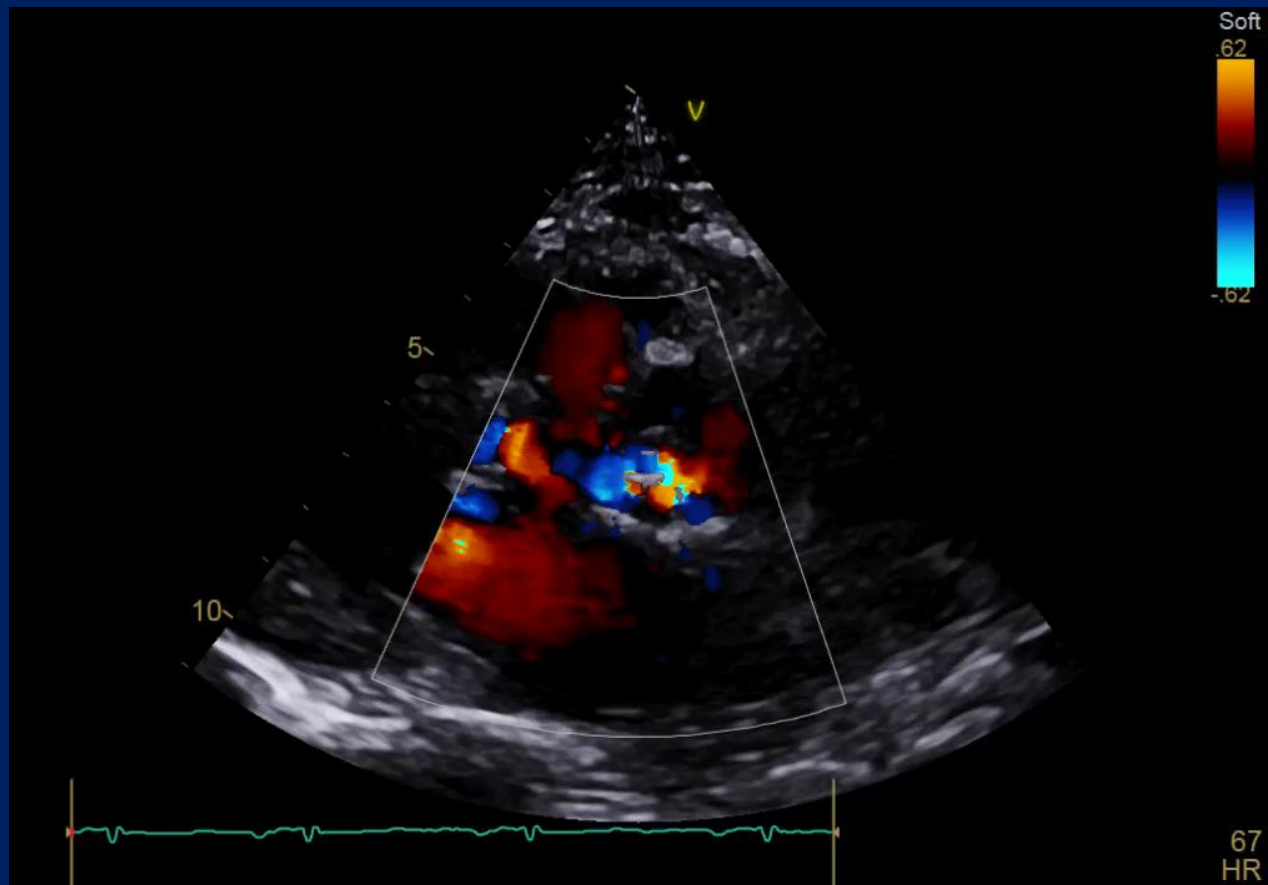


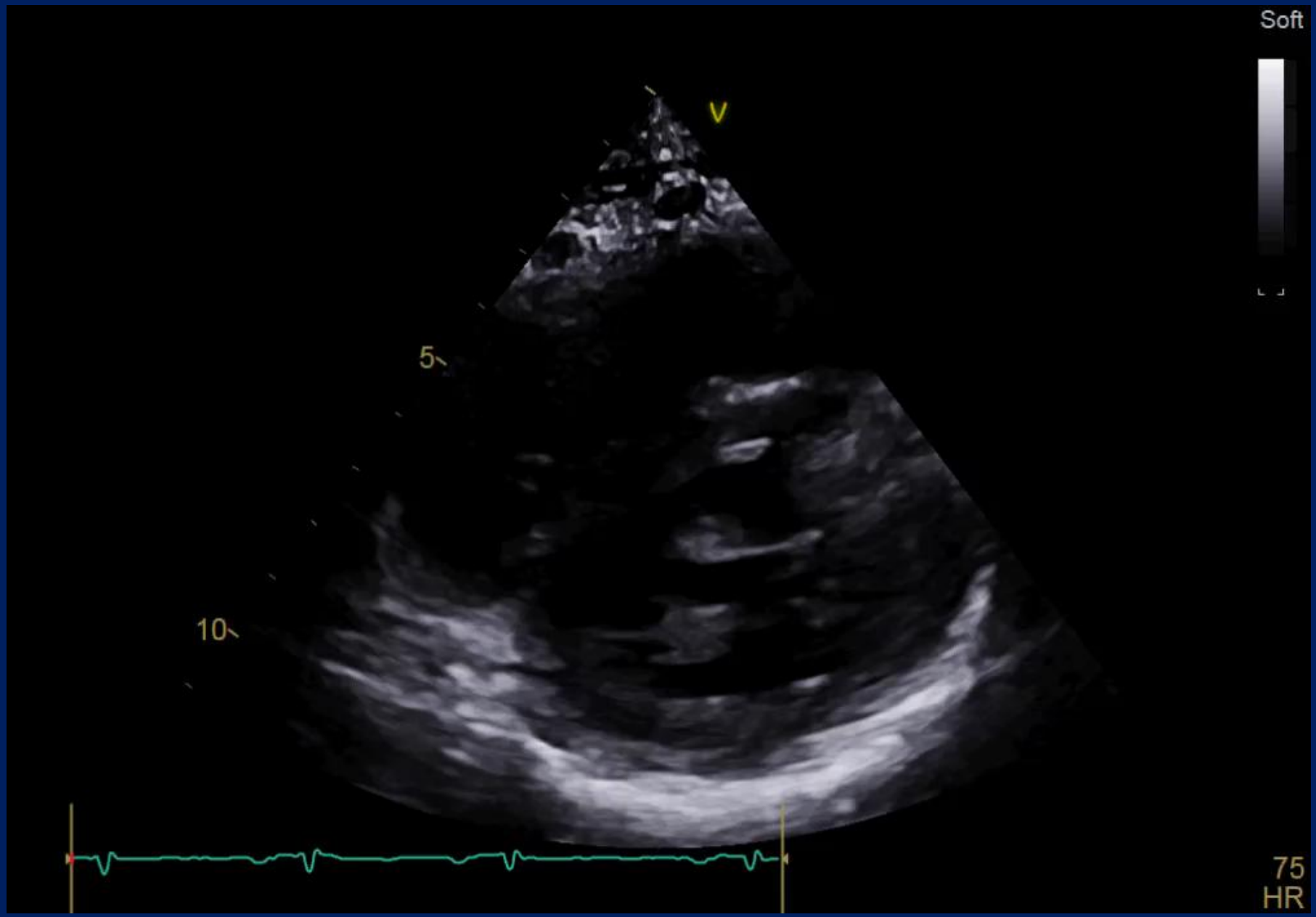


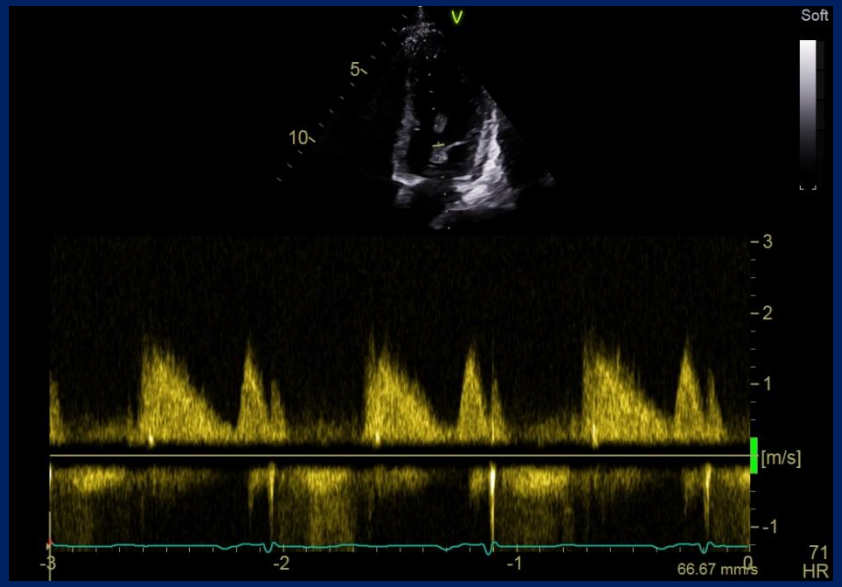
Dyspnée est + associée à l'⇗ relative de la PAPs et du GM > 90% à 60 w qu'au pic de PAPs de 60 mmHg

- Madame T 24 ans
- Atcd de RAA avec RM dilaté par voie percutanée en 2015
  - Bon résultat Sce > 1,5 cm2 Gm 4 mmHg
- Dyspnée d'effort 2 étages/ désir de grossesse

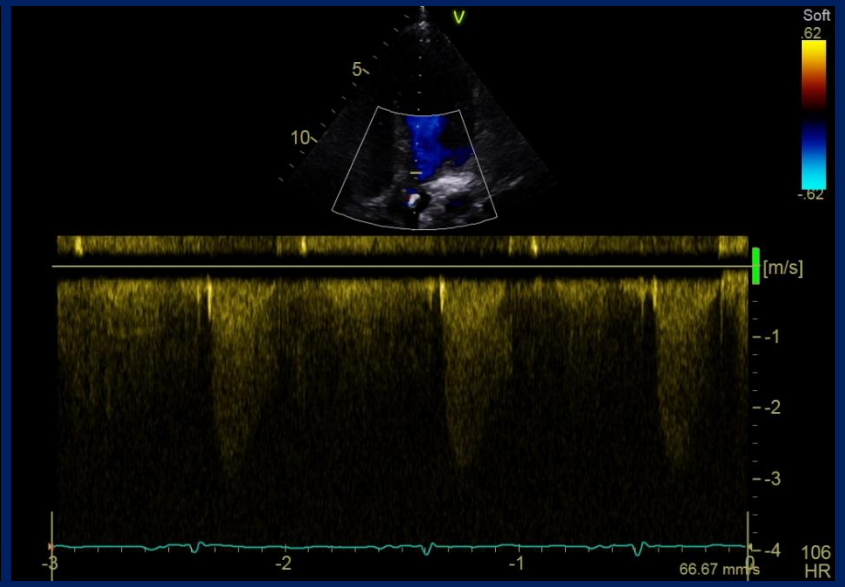

Soft
V
5
10
85
HR


Soft
.62
-.62
V
5
10
67
HR

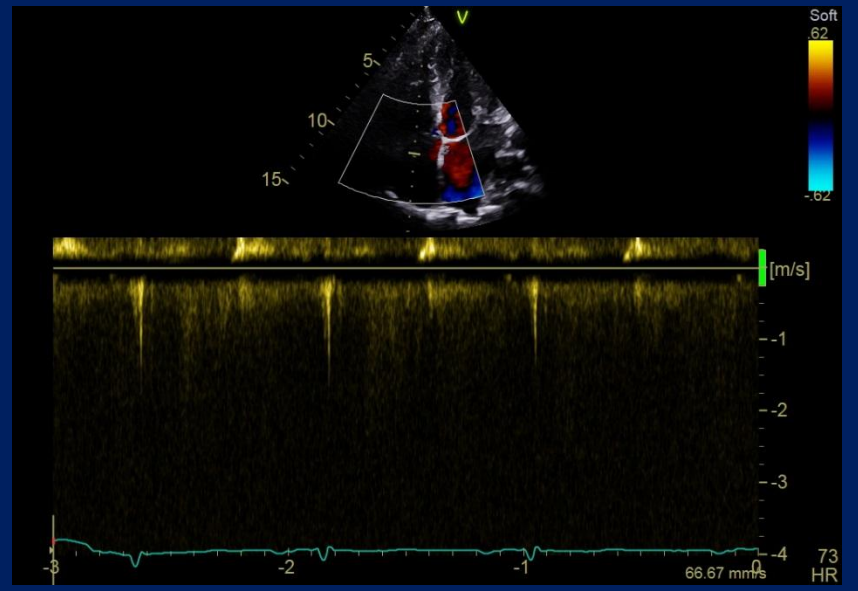

Soft
V
5
10
75
HR



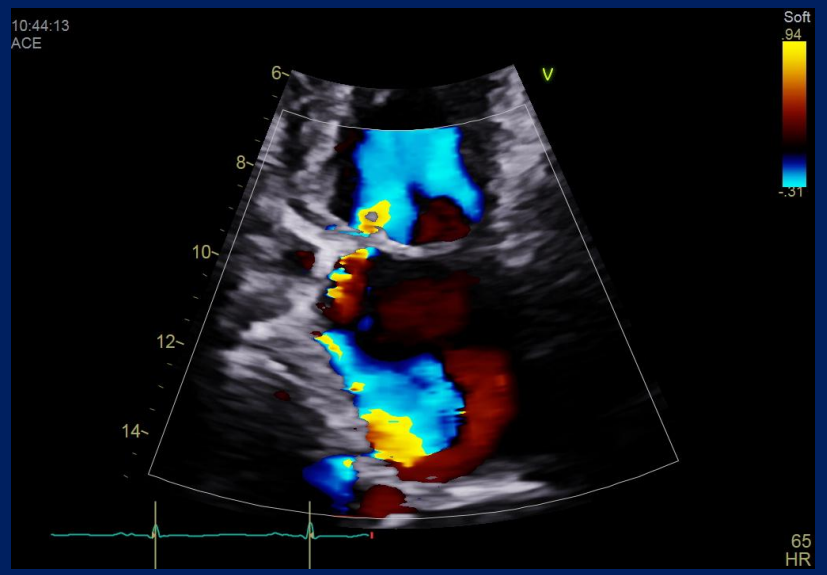
GM 5 mmHg sce 1,4cm2



GM 25 mmHg sce 1,2 cm2

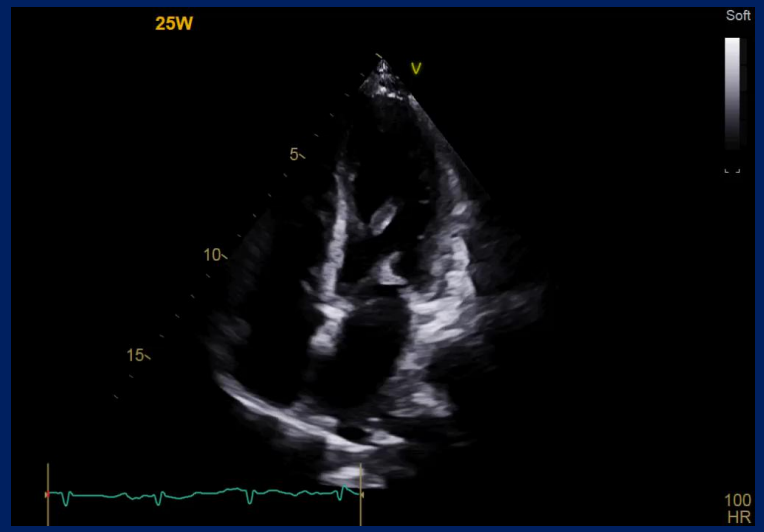


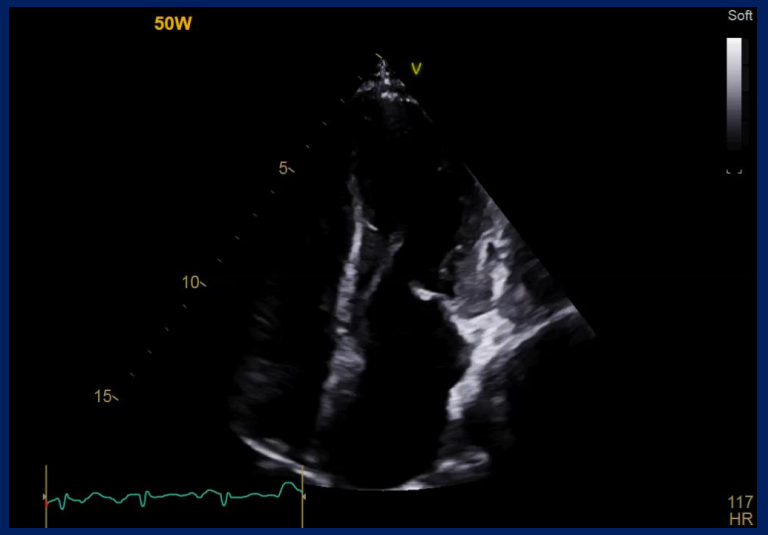
PAPs 21+10 soit 31 mmHg

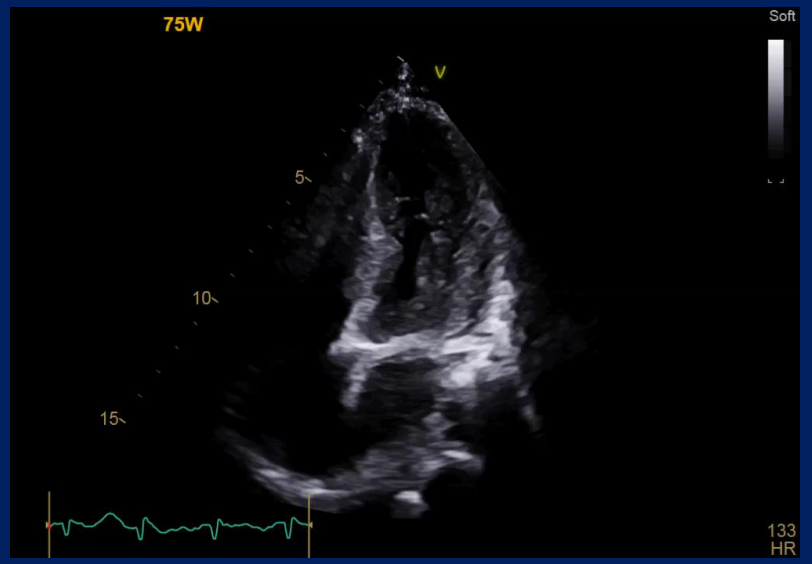


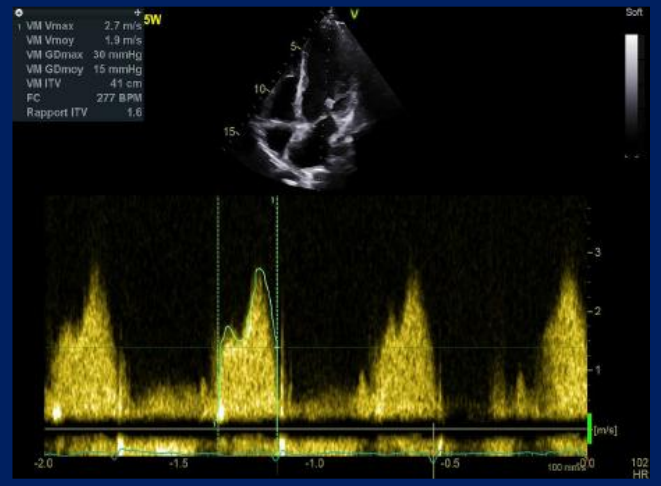
SOR 0.06cm2

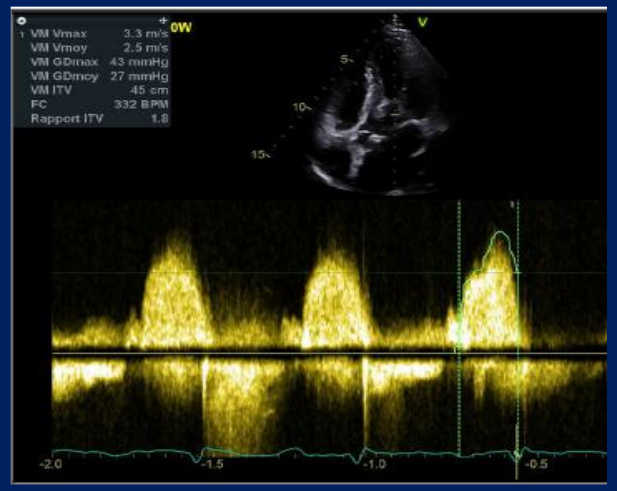
Echo d’effort

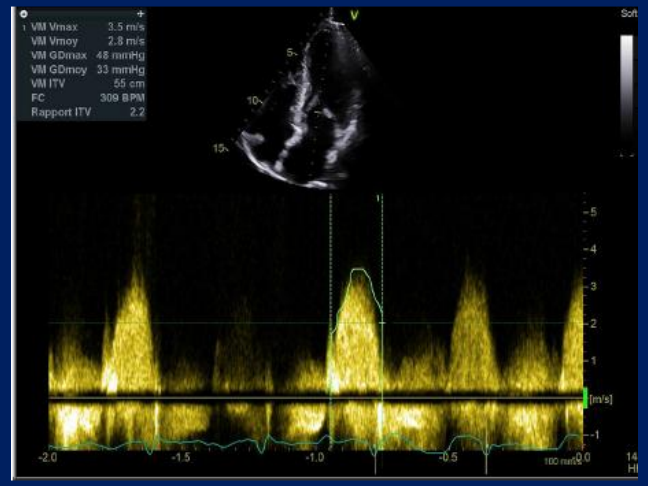












	repos	25w	50w	75w
Fc	76	100	125	148 (76% FMT)
PAS	120	140	160	
GM mitral	5	15	25	33
GM aortique	25	29	33	48
PAPs	26	33	62	67

EE stoppée pour dyspnée

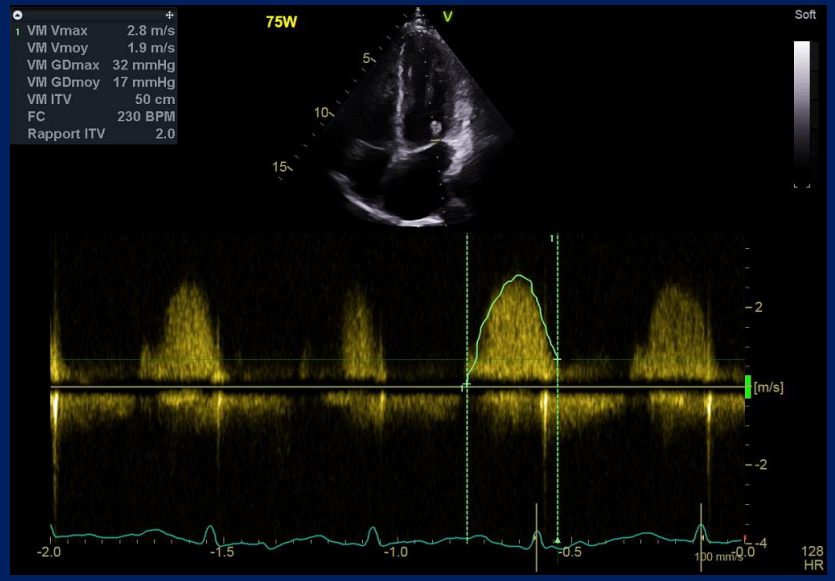
CAT

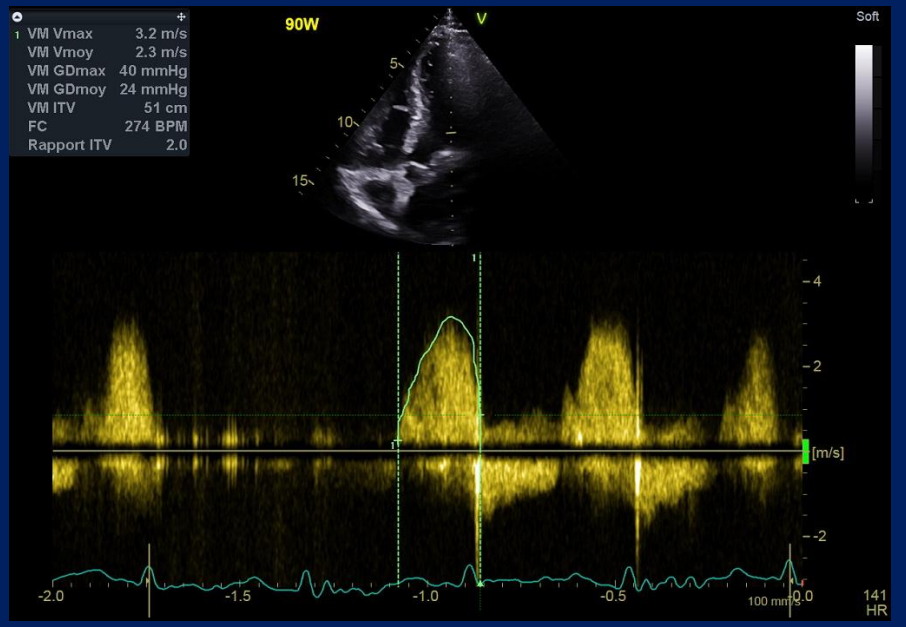
- RVM et RVAo?
- VPM per cutanée?
- Autre?

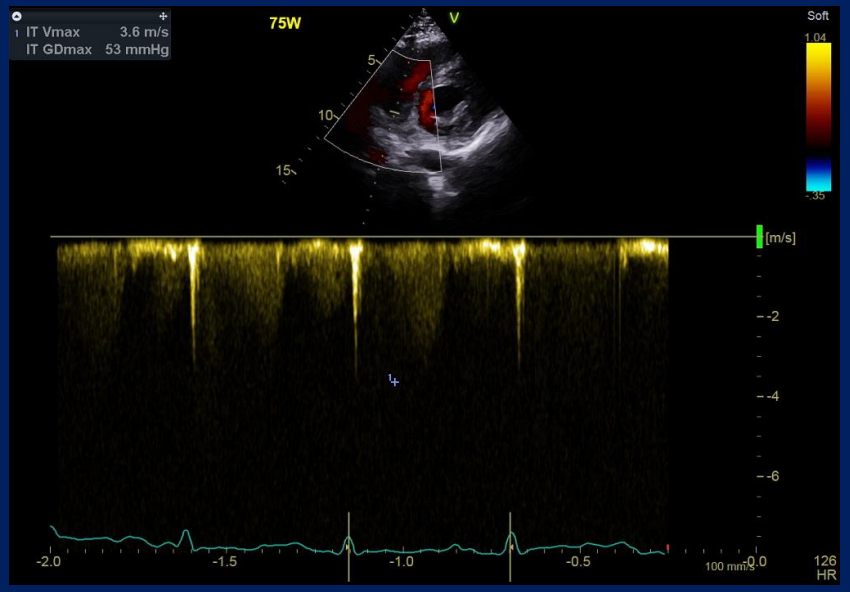
Interprétation

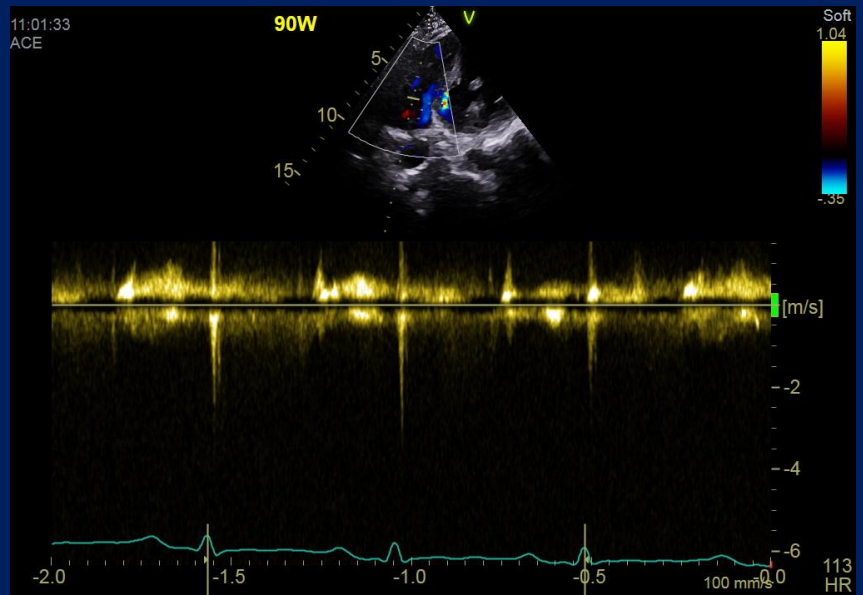
- RM lâche sans indication à une VPC ni à un RVM
- Mauvaise tolérance
  - ↑ Qc ↑ des gradients et ↑ PAPs probablement secondaire à la tachycardie
  - Bétabloquants+++
- Mise sous cardensiel 2.5 mg patiente devient asymptomatique (DE> 3 étages)

Echo d’effort sous bêtabloquant

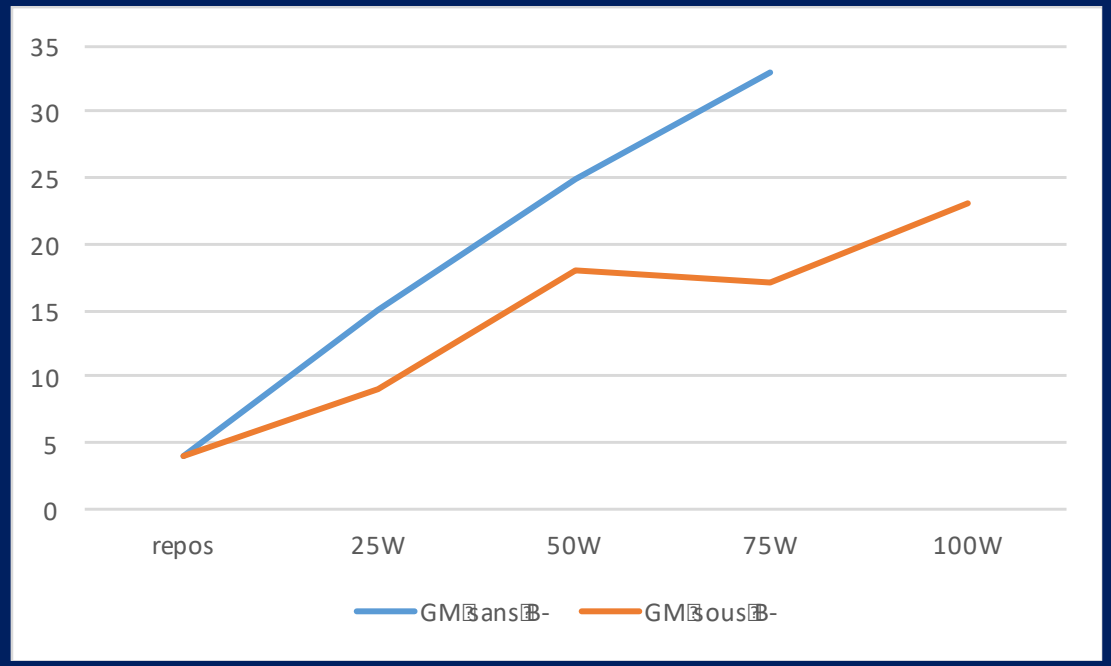


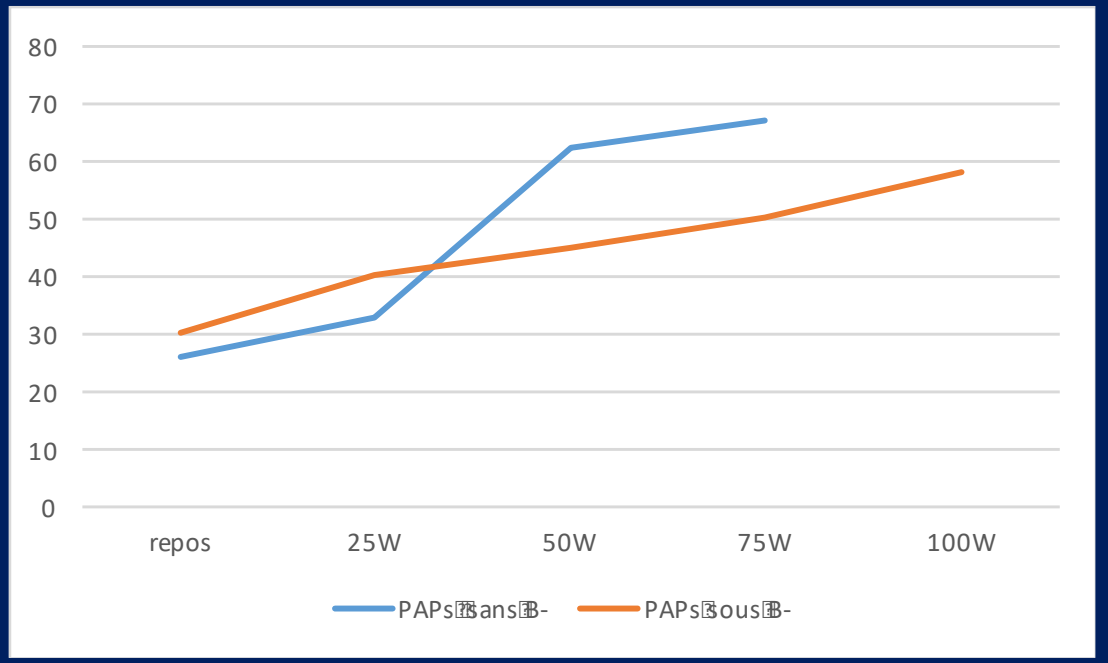






EVOLUTION DU GRADIENT ET DE LA PAPS BOUS B BLOQUANT





EE stoppée pour dl musculaires

Insuffisance mitrale primitive

Indications echo d'effort ; discordance clinique écho

- IM sévère patient asymptomatique
- IM modérée patient symptomatique

Exercise echocardiography evaluates dynamic changes in regurgitant jet and pulmonary pressures during peak exercise, and might be helpful in patients with discordant symptoms and regurgitation severity at rest.[515,516]

ESC guidelines 2025

COR	LOE	RECOMMENDATION
2a	B-NR	1. In patients with primary MR (Stages B and C) and symptoms that might be attributable to MR, hemodynamic exercise testing using Doppler echocardiography or cardiac catheterization or cardiopulmonary exercise testing is reasonable (1-4).

ACC/AHA guidelines 2021

78 patients asympto
IM Ire > 20 mm3
FEVG conservée

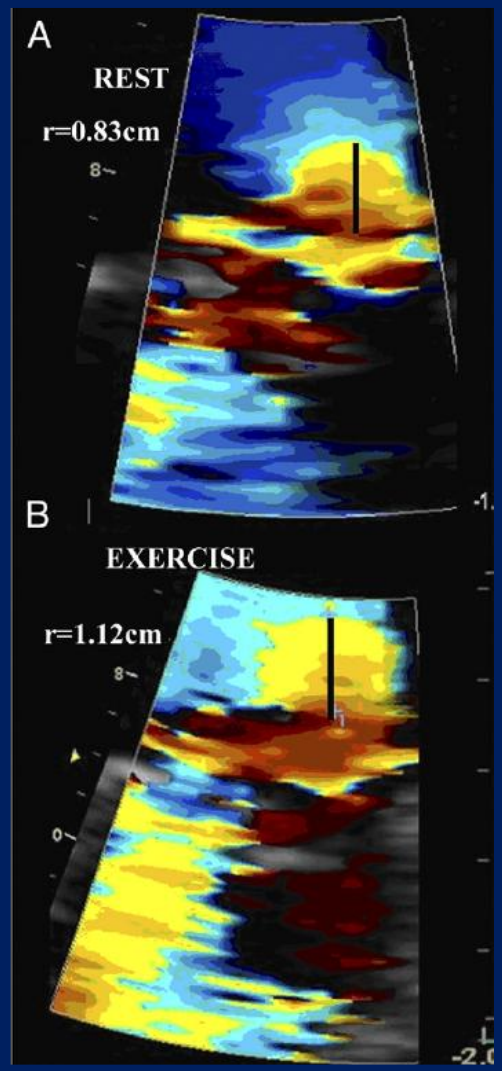
Fréquence PAPs > 60 mmHg à l'effort
= 46%

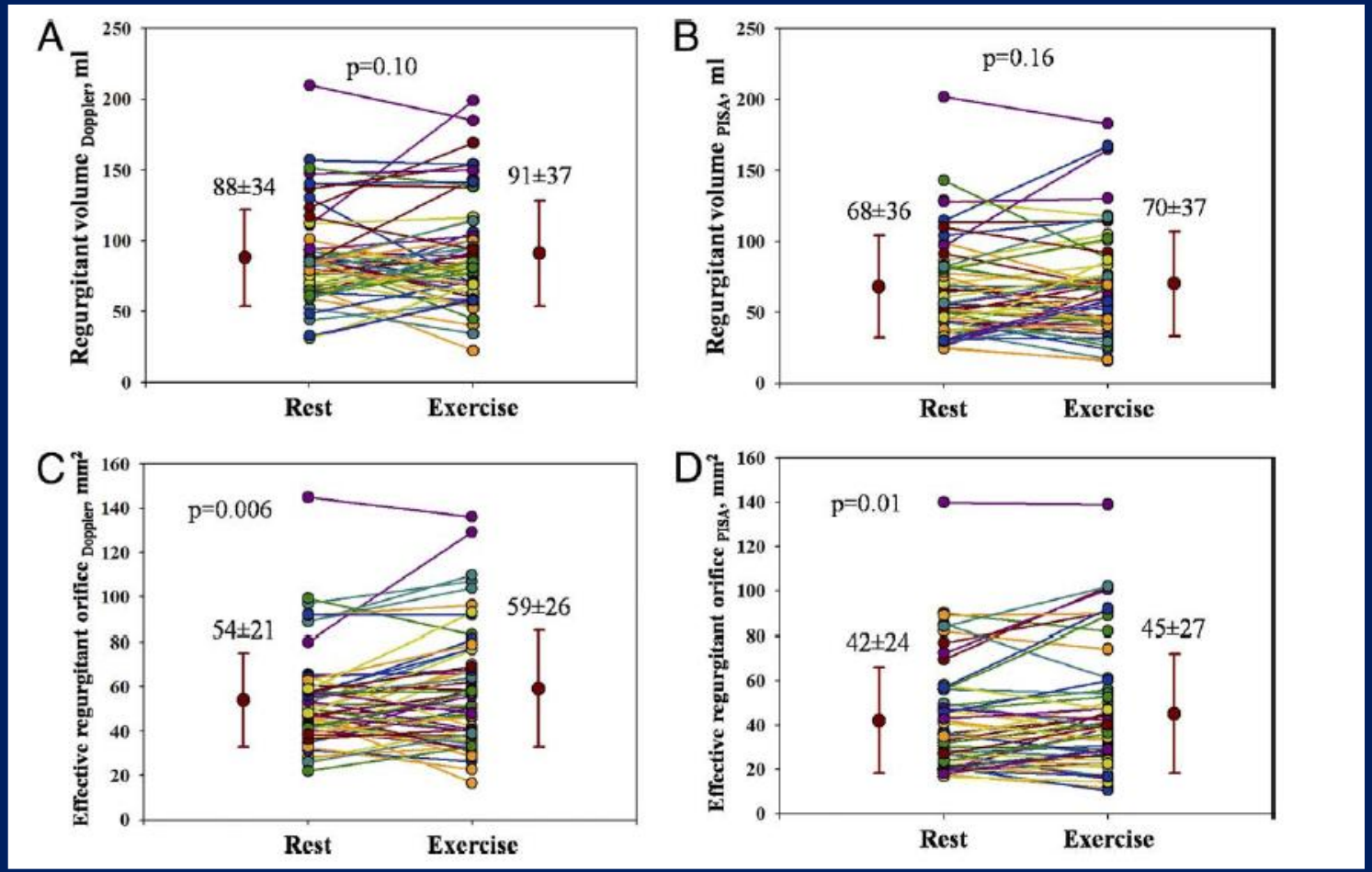
Table 2. Resting and Exercise Echocardiographic Data

Variables	All Patients (n=78)	No Exercise PHT (n=42, 54%)	Exercise PHT (n=36, 46%)	*P*
MR				
Severe MR, n (%)	47 (60)	26 (62)	21 (58)	0.93
Resting ERO, mm^2	43±20	43±23	42±16	0.83
Exercise ERO, mm^2	48±26	42±27	55±23	0.03
Resting RV, mL	71±27	73±35	69±20	0.55
Exercise RV, mL	73±36	65±39	83±28	0.03
Resting SPAP, mm Hg	39±11	33±6	46±10	<0.0001
Exercise SPAP, mm Hg	62±17	46±10	77±12	<0.0001

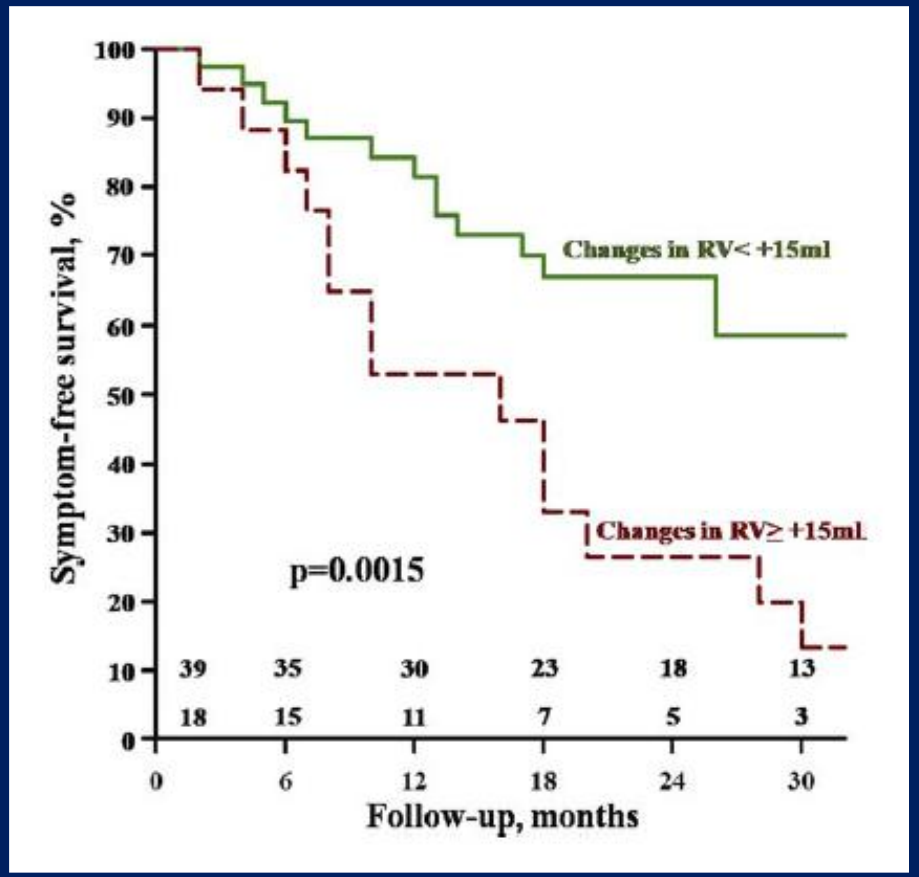
Magne circulation 2010

- 74 asymptomatiques patients, IM Ire> 20mm2 FEVG conservée
- Effort : ↑> 15ml ou 10 mm2 chez 1/3des patients

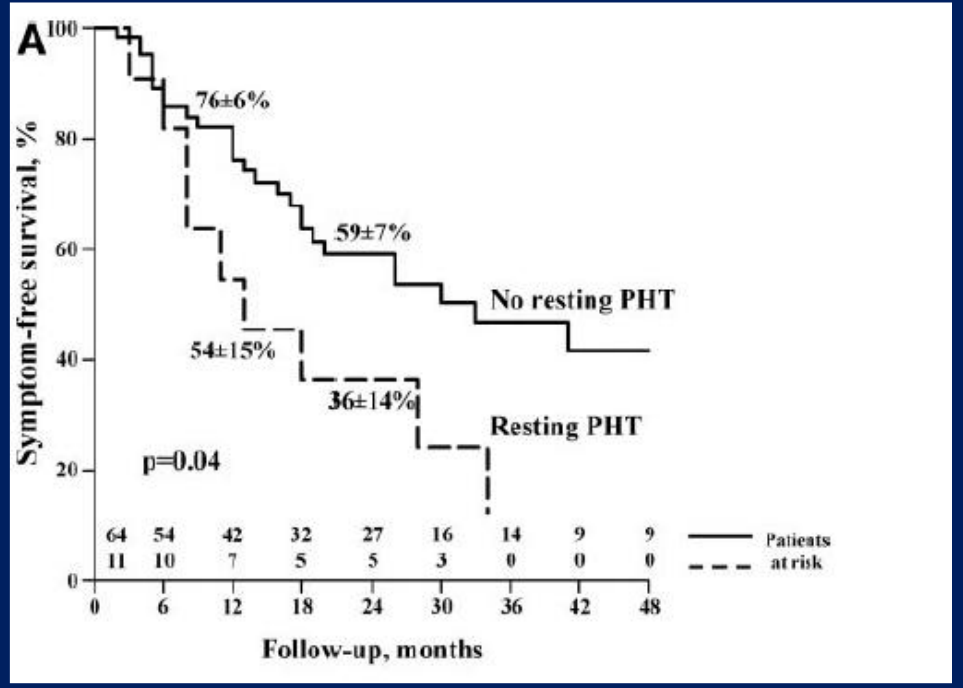


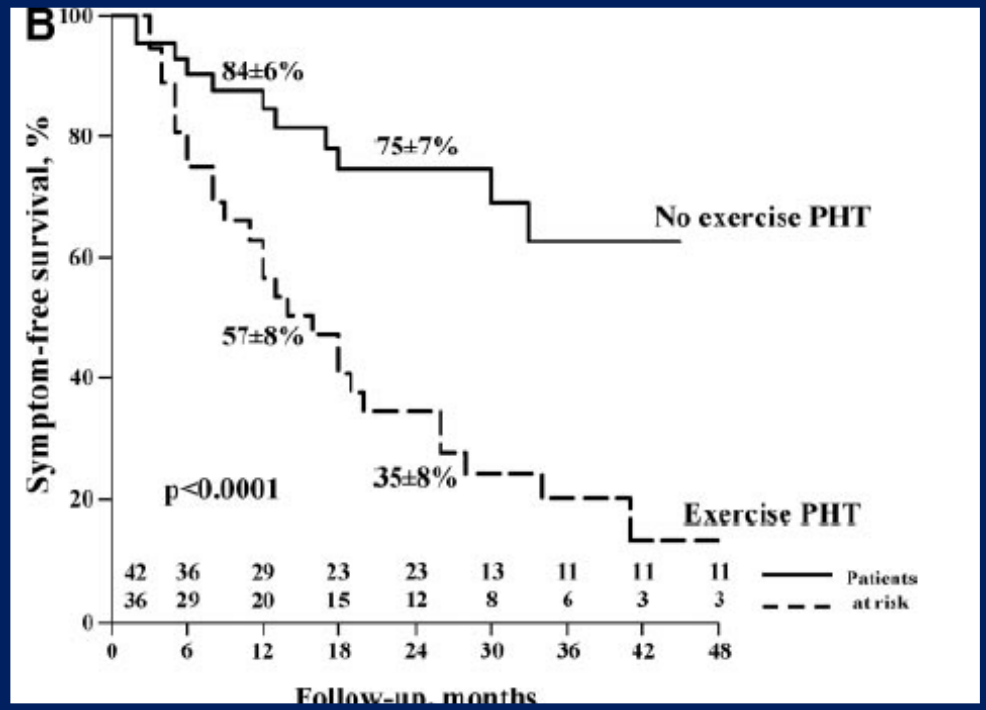


Magne J, J Am colll cardiol 2010

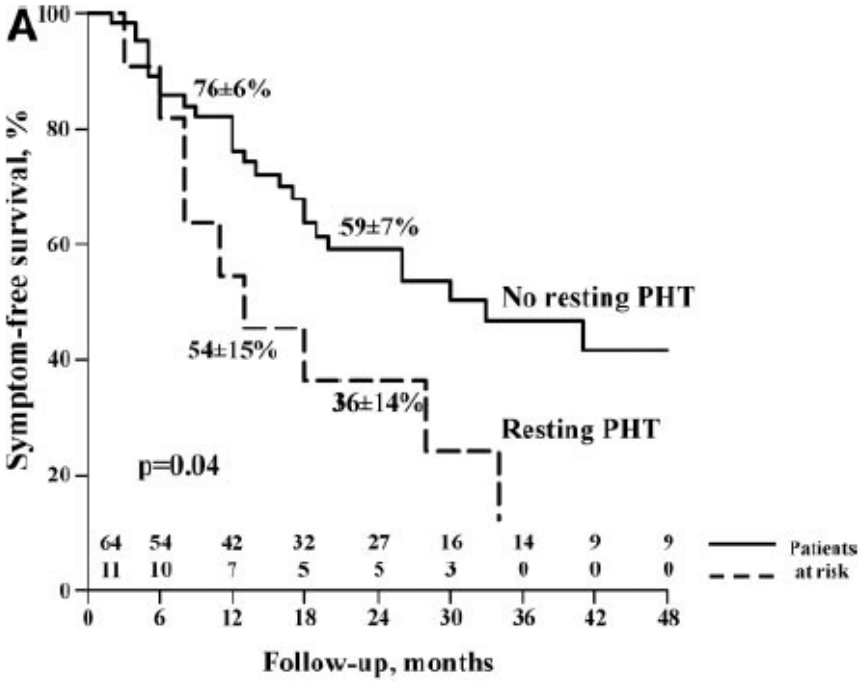


Magne J, J Am colll cardiol 2010





Magne J, circulation 2010



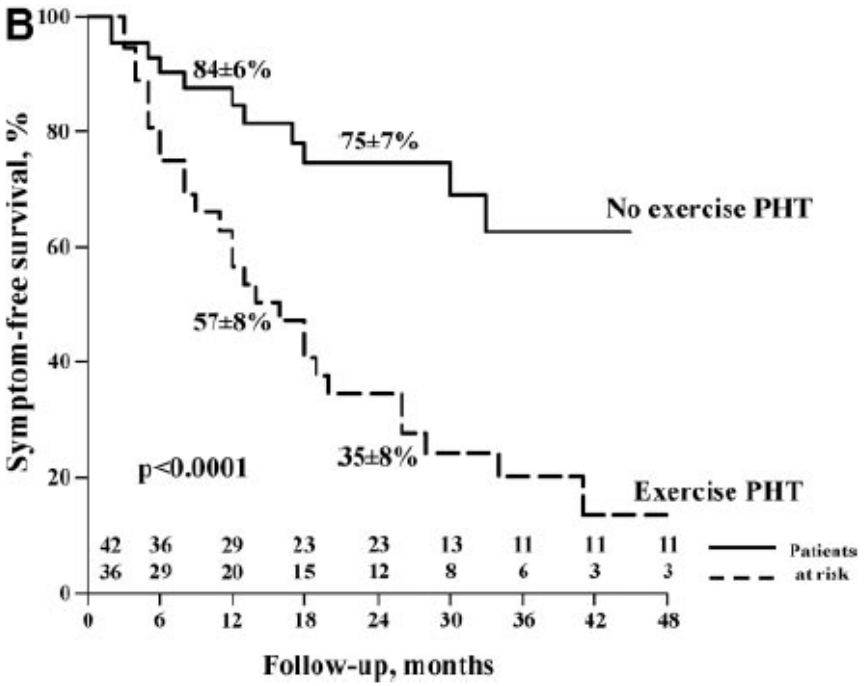
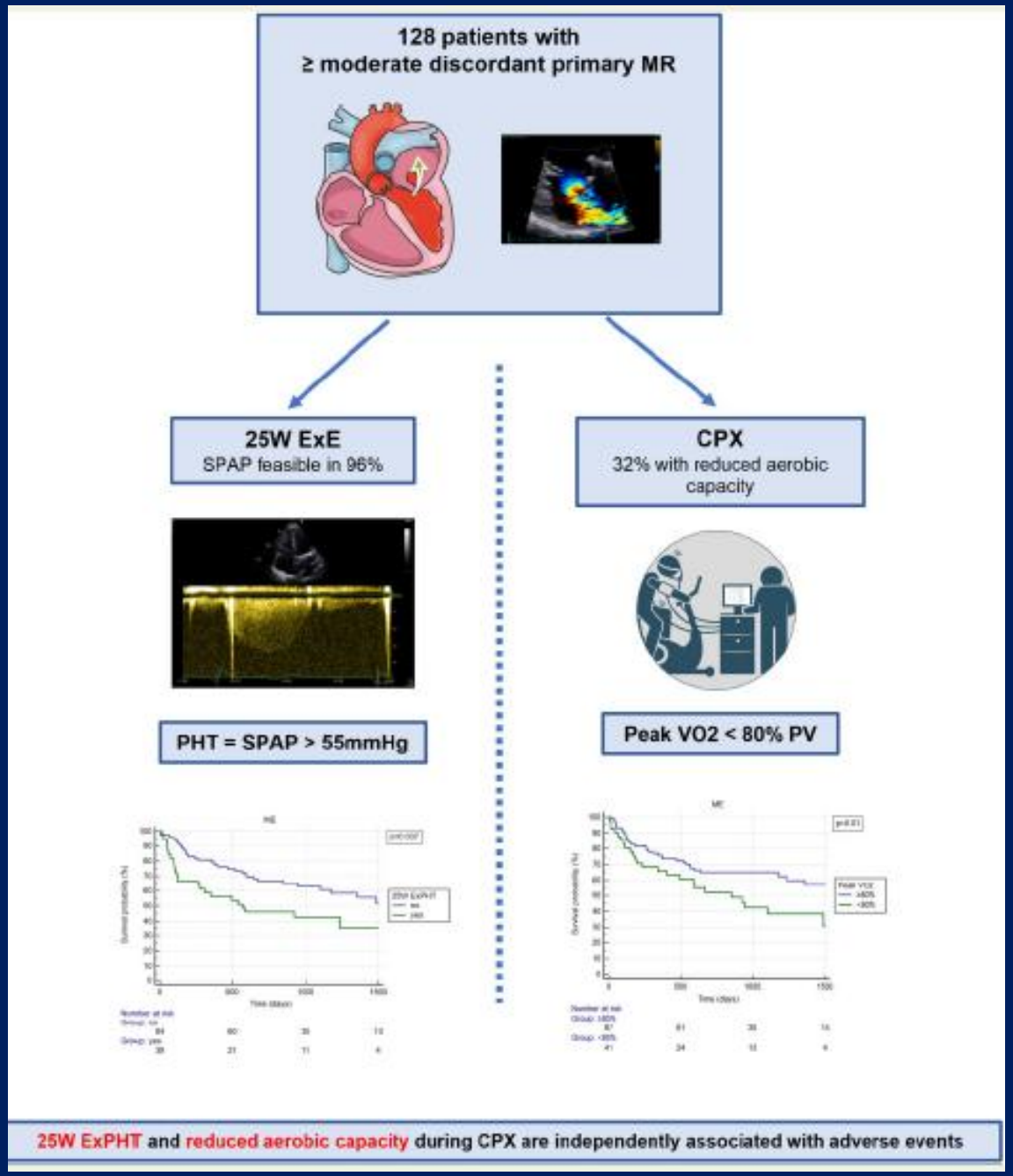


Table 6. Multivariable Logistic Regression: Prediction of Exercise Arterial PHT

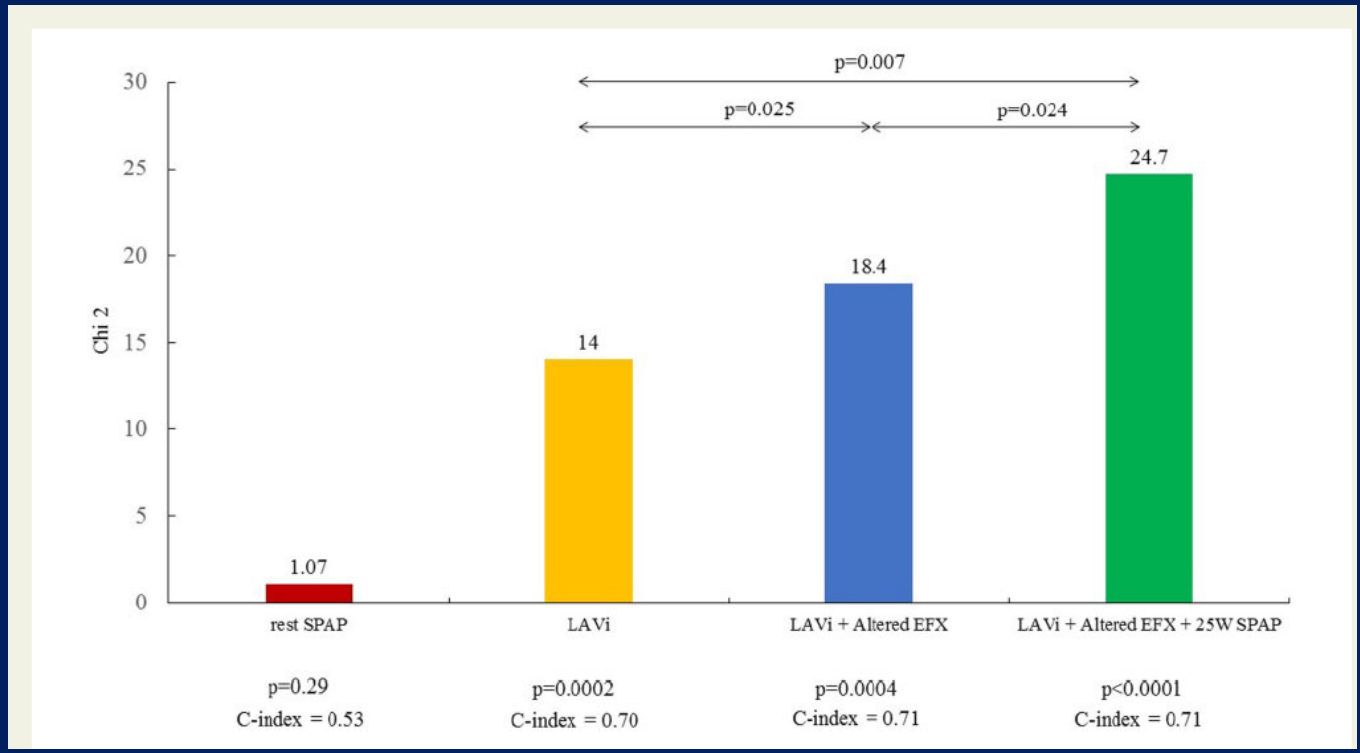
Variables	Odds Ratio	95% CI	*P*
Age	1.15	1.06–1.41	0.004
Sex	3.74	0.24–6.97	0.41
Exercise LVED volume	1.01	0.98–1.05	0.31
Resting SPAP	1.33	1.14–1.52	0.006
Exercise ERO	1.12	1.04–1.25	0.002

LVED indicates left ventricular end-diastolic.

Magne circulation 2010



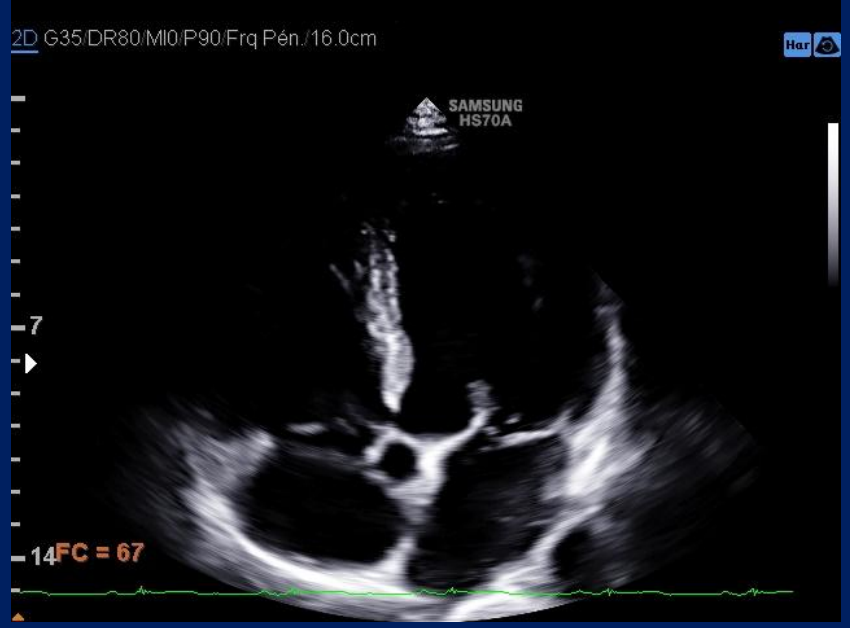
Age moyen 58 ans, suivi 5 ans
IM modérée 17% moyenne 47% sévère 35%
Critère Ire : DC, IC, intervention motivée par l'apparition de symptômes ou dysfonction VG

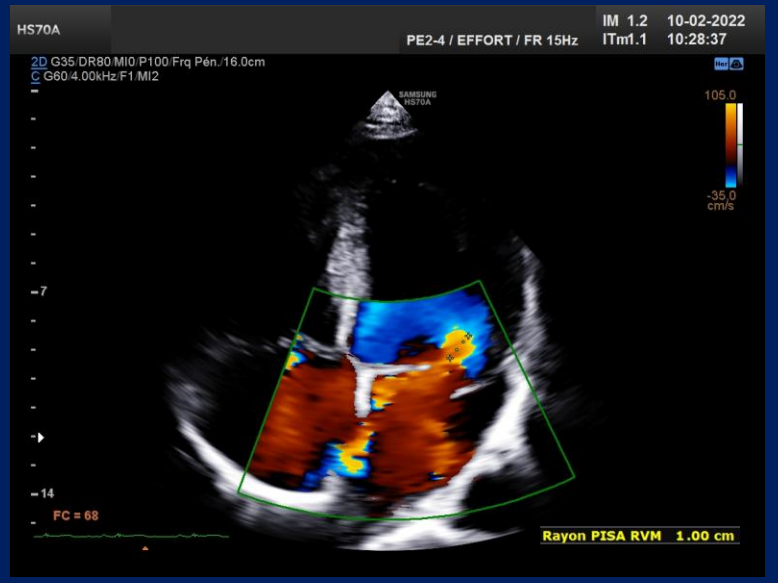


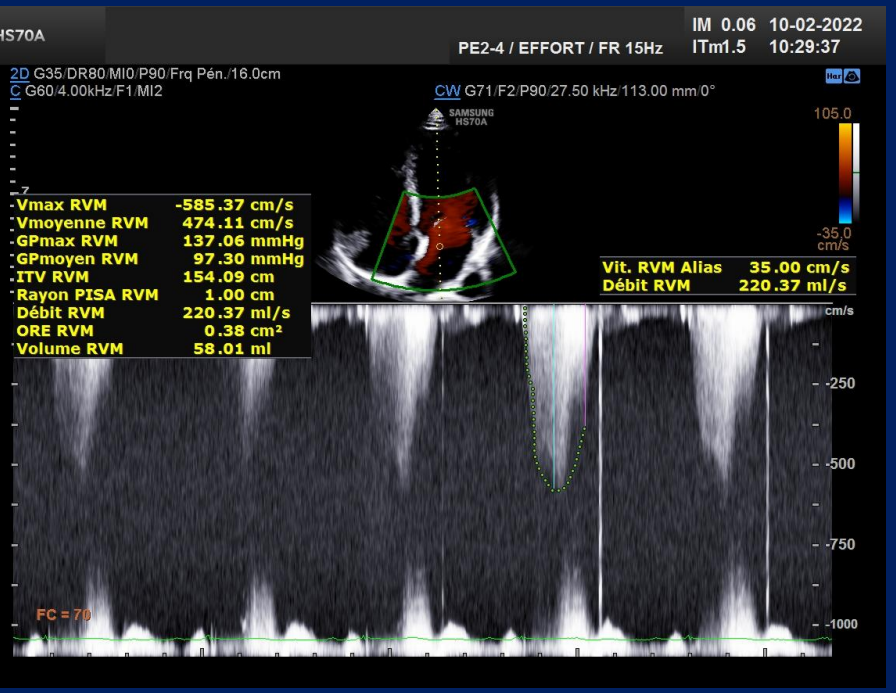
Coisne A Eur Heart J 2022

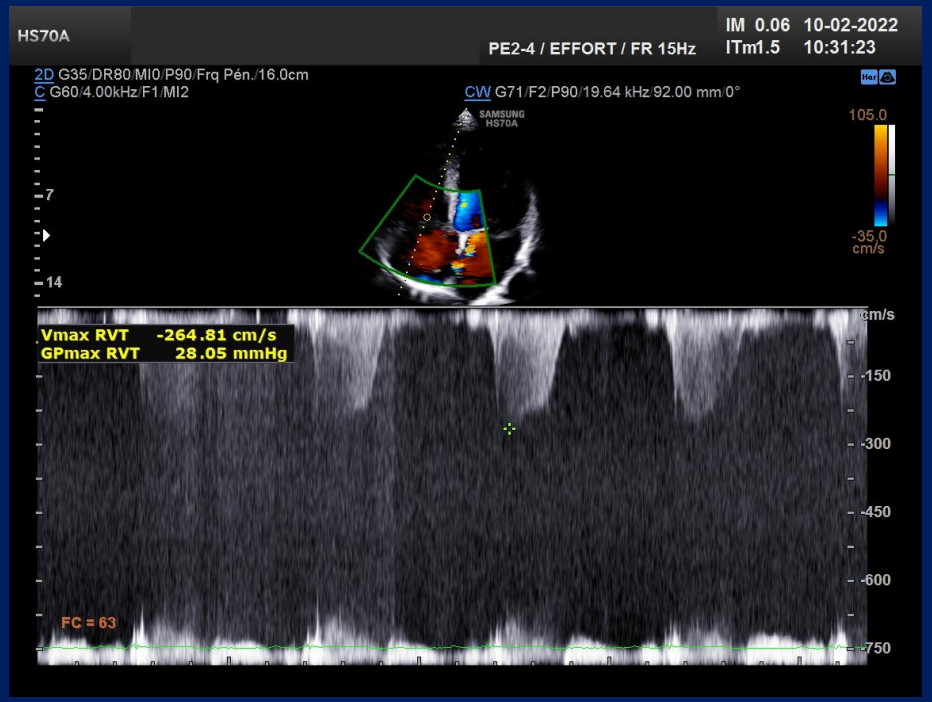
Mr D 40 ans

- Découverte d’un souffle à l’auscultation
- Asymptomatique
- VG 60/40mm IM importante prolapsus P2
- Holter RS permanent
- BNP 60 pg/ml

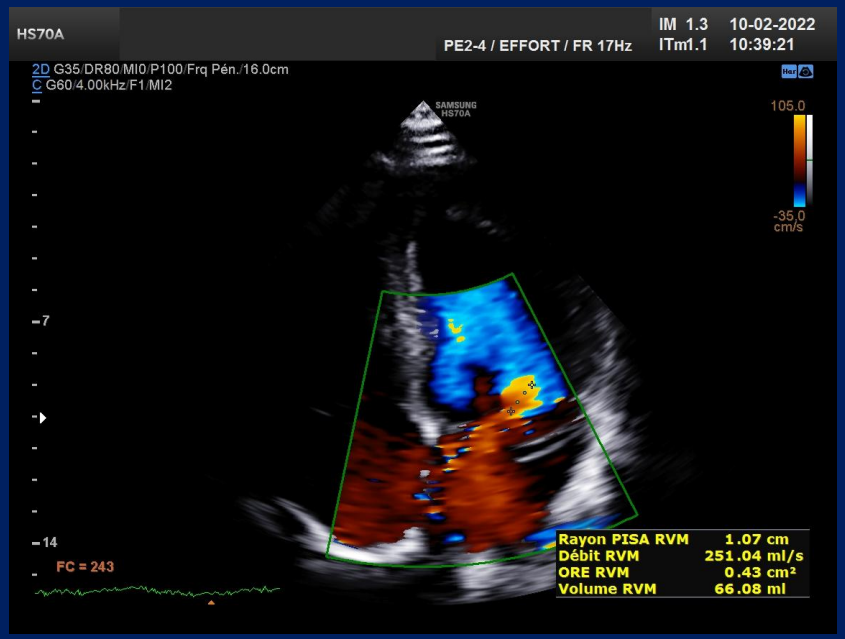

2D G35/DR80/MI0/P90/Frq Pén./16.0cm
SAMSUNG
HS70A
7
14
FC = 67

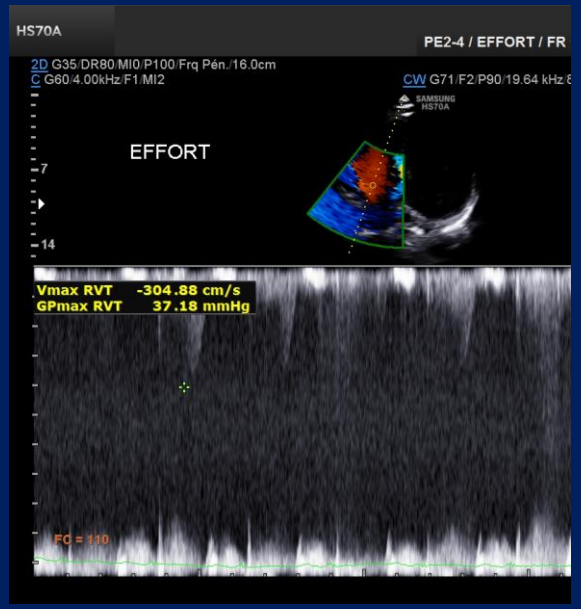

HS70A
IM 1.2 10-02-2022
PE2-4 / EFFORT / FR 15Hz ITm1.1 10:28:37
2D G35/DR80/MI0/P100/Frq Pén./16.0cm
C G60/4.00kHz/F1/MI2
105.0
-35.0
cm/s
7
14
FC = 68
Rayon PISA RVM 1.00 cm

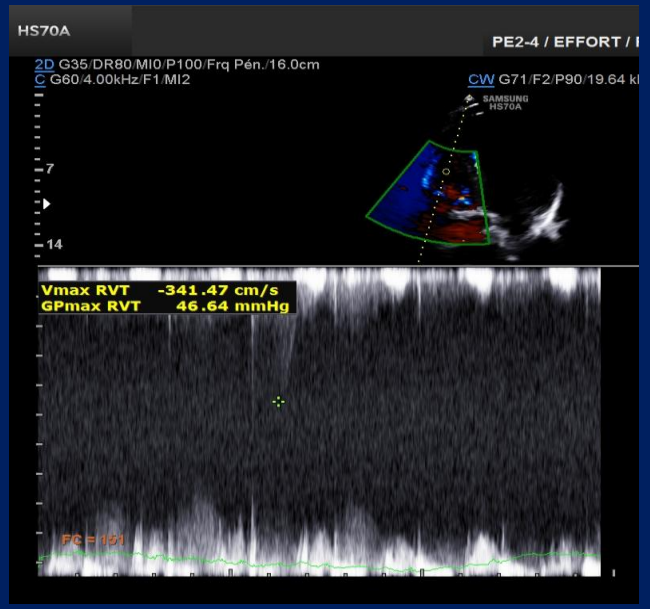

HS70A
IM 0.06 10-02-2022
PE2-4 / EFFORT / FR 15Hz ITm1.5 10:29:37
2D G35/DR80/MI0/P90/Frq Pén./16.0cm
C G60/4.00kHz/F1/MI2
CW G71/F2/P90/27.50 kHz/113.00 mm/0°
105.0
-35.0
cm/s
Vmax RVM -585.37 cm/s
Vmoyenne RVM 474.11 cm/s
GPmax RVM 137.06 mmHg
GPmoyen RVM 97.30 mmHg
ITV RVM 154.09 cm
Rayon PISA RVM 1.00 cm
Débit RVM 220.37 ml/s
ORE RVM 0.38 cm²
Volume RVM 58.01 ml
Vit. RVM Alias 35.00 cm/s
Débit RVM 220.37 ml/s
cm/s
-250
-500
-750
-1000
FC = 70

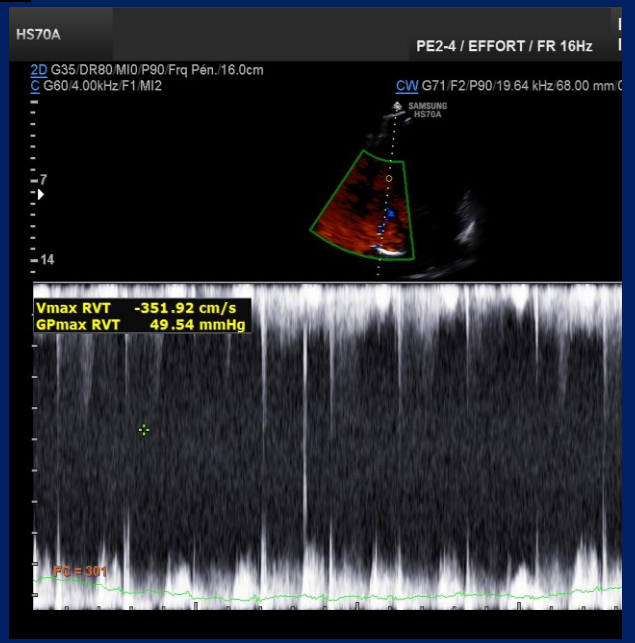

HS70A
IM 0.06 10-02-2022
PE2-4 / EFFORT / FR 15Hz ITm1.5 10:31:23
2D G35/DR80/MI0/P90/Frq Pén./16.0cm
C G60/4.00kHz/F1/MI2
CW G71/F2/P90/19.64 kHz/92.00 mm/0°
105.0
-35.0
cm/s
7
14
Vmax RVT -264.81 cm/s
GPmax RVT 28.05 mmHg
cm/s
-150
-300
-450
-600
-750
FC = 63

EE neg 240W 90% FMT





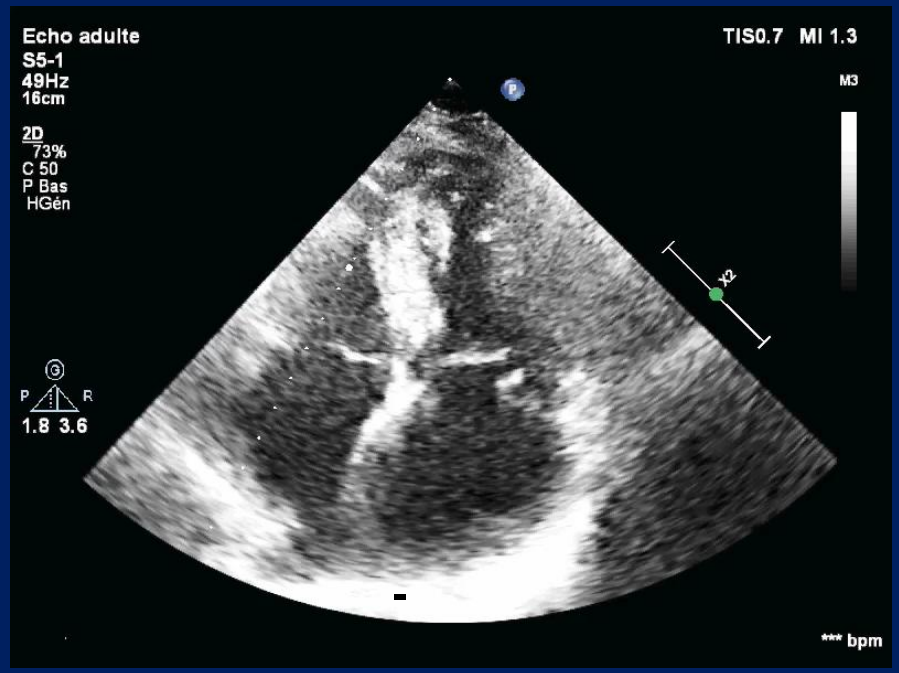


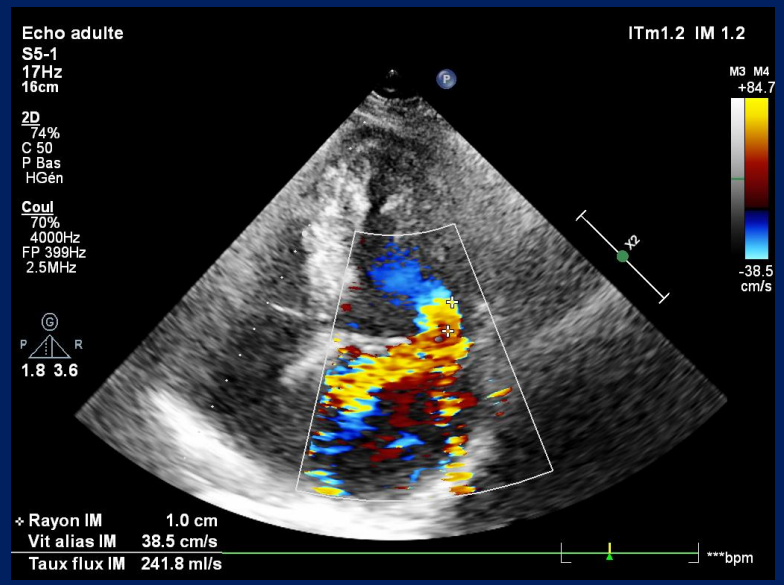


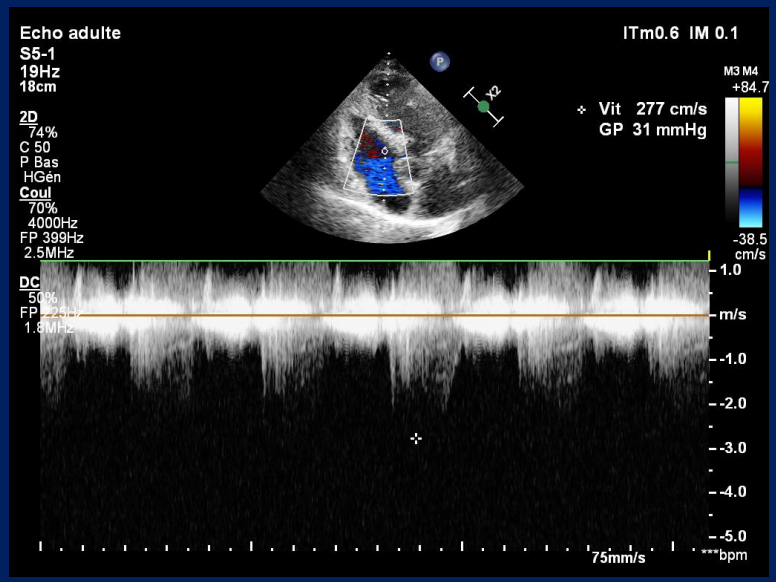
Mr G … 70 ans

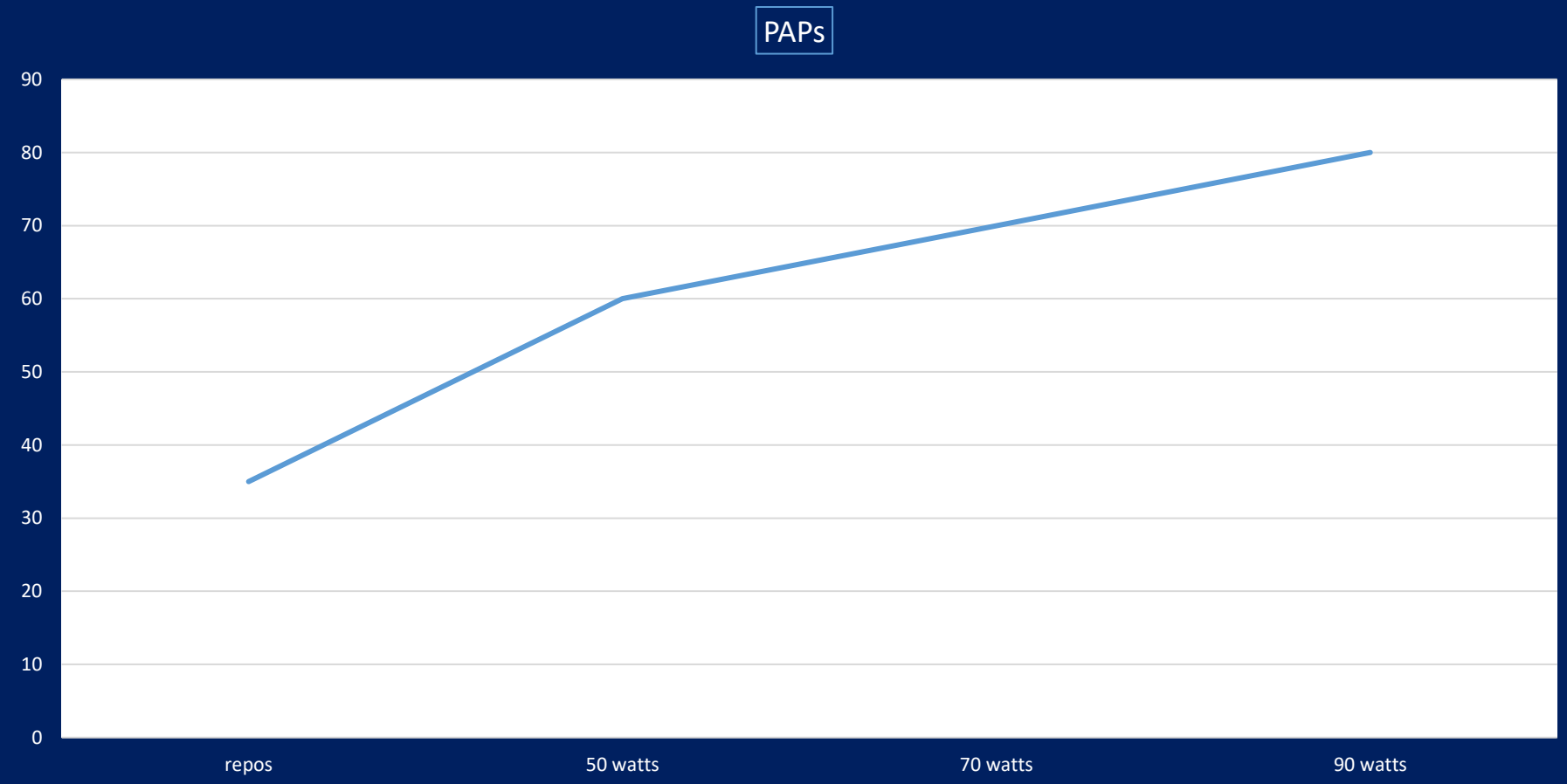
- IM prolapsus de P2 aysymptomatique VG 55/30 mm FEVG 65% Holter longue durée pas de FA OG 22cm2 BNP 70pg/ml
- « tout va bien je fais mon jardin sans pb »

SOR 0,40cm2
PAPs 35 mmHG



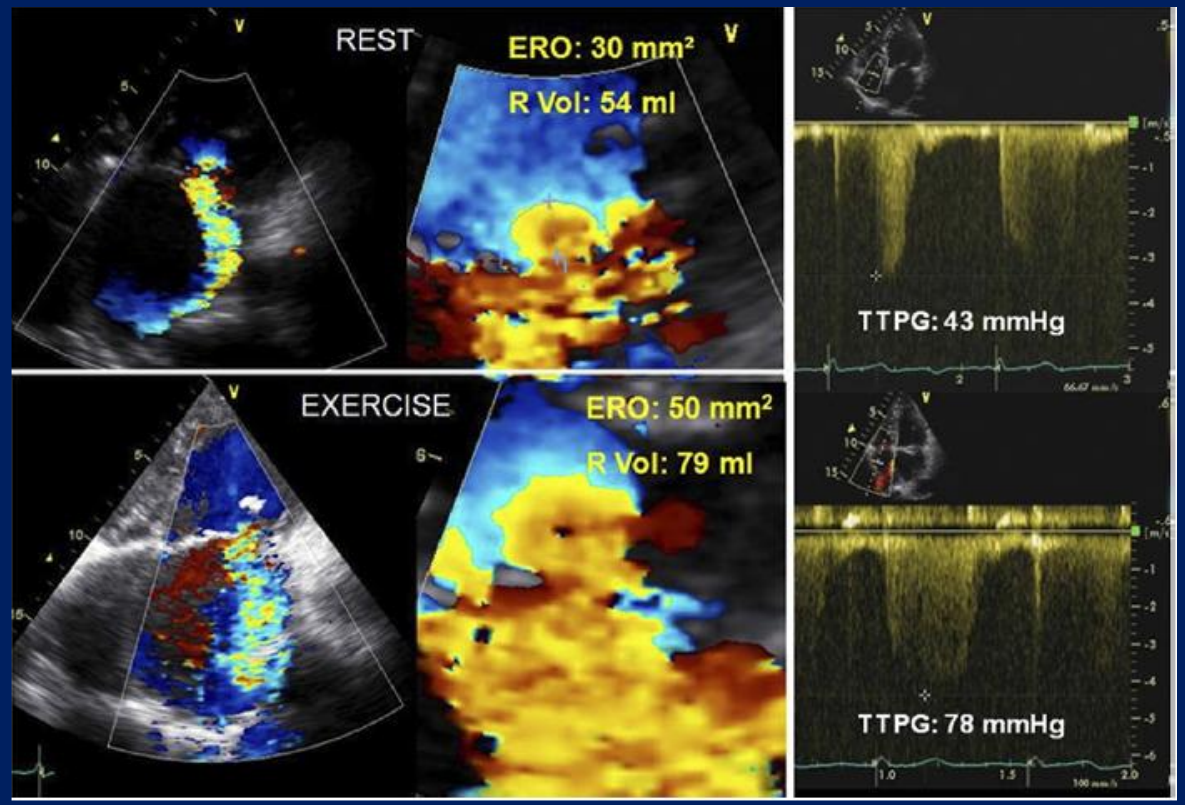


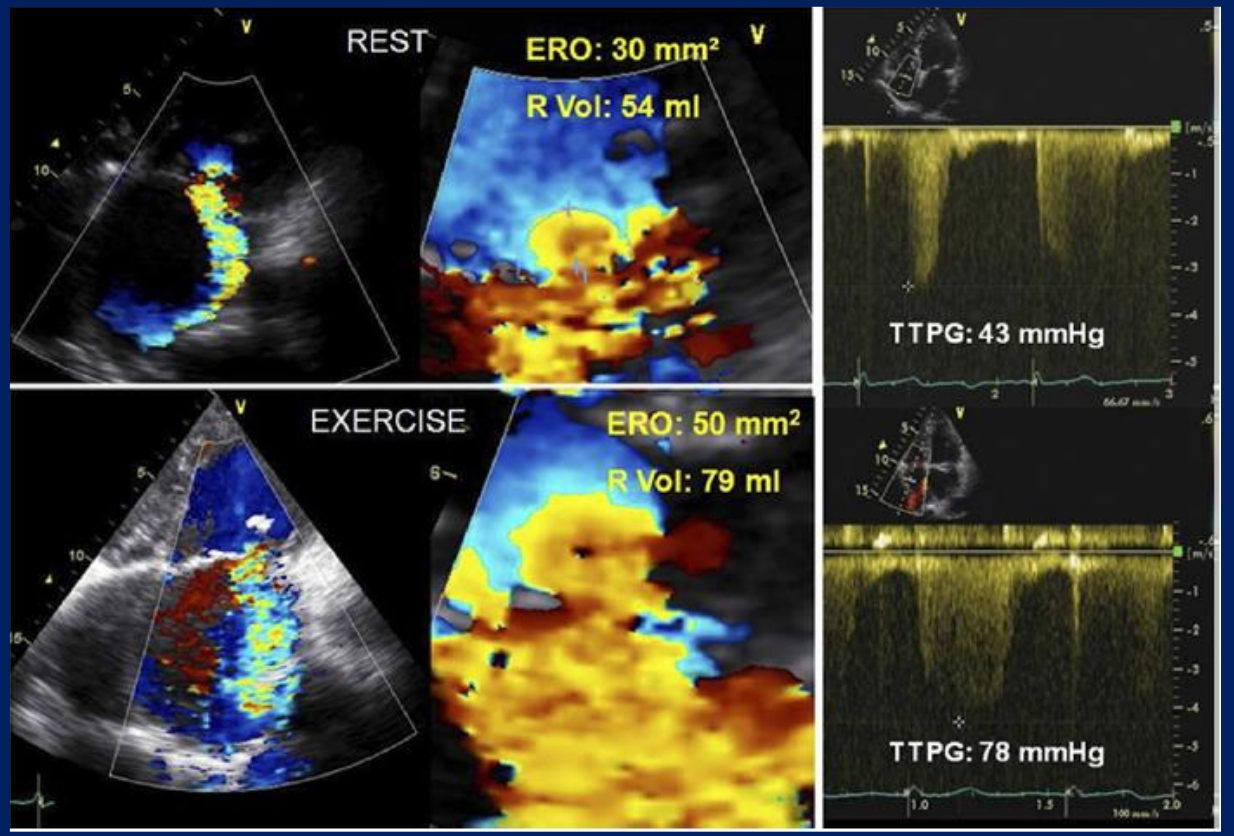




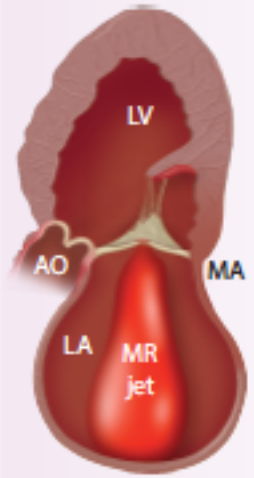
ECG ESV polymorphes des 70Watts

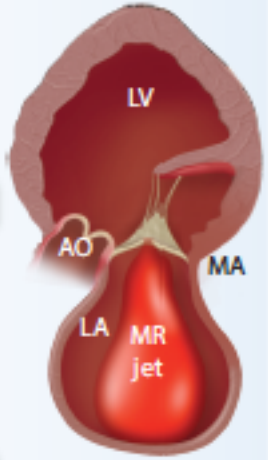
Insuffisance mitrale secondaire





Key criteria	Atrial SMR	Ventricular SMR
	LVEF ≥50% without regional wall motion abnormalities	LVEF <50% with or without regional wall abnormalities
	No or mildly dilated LV cavity[a] without leaflet tethering	Restrictive leaflet motion with tethering
	Mitral annulus dilatation (AP >35 mm)	Normal leaflet morphology
	Enlarged LA (LAVI >34 mL/m^2)	Central or eccentric jet
Additional echocardiographic criteria[b]		
	Normal leaflet motion	Dilated LV
	Normal leaflet morphology	Dilated LA
	Usually central jet	Dilated MV annulus
Additional clinical criteria		
	Atrial fibrillation	Ischaemic heart disease
	HFpEF	Dilated cardiomyopathy





ESC EACTS

recommandations

Recommendations	Class[a]	Level[b]
Severe atrial secondary mitral regurgitation		
MV surgery, surgical AF ablation, if indicated, and LAAO should be considered in symptomatic patients with severe atrial SMR under optimal medical therapy.[627–630,636,637]	IIa	B
TEER may be considered in symptomatic patients with severe atrial SMR not eligible for surgery after optimization of medical therapy including rhythm control, when appropriate.[588,590,638,639]	IIb	B
Ventricular secondary mitral regurgitation and concomitant coronary artery disease		
MV surgery is recommended in patients with severe ventricular SMR undergoing CABG.[640]	I	B
MV surgery may be considered in patients with moderate SMR undergoing CABG.[622–624,641,642]	IIb	B
PCI followed by TEER after re-evaluation of MR may be considered in symptomatic patients with chronic severe ventricular SMR and non-complex CAD.[150]	IIb	C
Severe ventricular secondary mitral regurgitation without concomitant coronary artery disease		
TEER is recommended to reduce HF hospitalizations and improve quality of life in haemodynamically stable, symptomatic patients with impaired LVEF (<50%) and persistent severe ventricular SMR, despite optimized GDMT and CRT (if indicated), fulfilling specific clinical and echocardiographic criteria.[c] [583,584,606,608,643]	I	A
TEER may be considered for symptom improvement in selected symptomatic patients with severe ventricular SMR not fulfilling the specific clinical and echocardiographic criteria,[c] after careful evaluation of LVAD or HTx.[203,608–610]	IIb	B
MV surgery may be considered in symptomatic patients with severe ventricular SMR without advanced HF who are not suitable for TEER.[617]	IIb	C

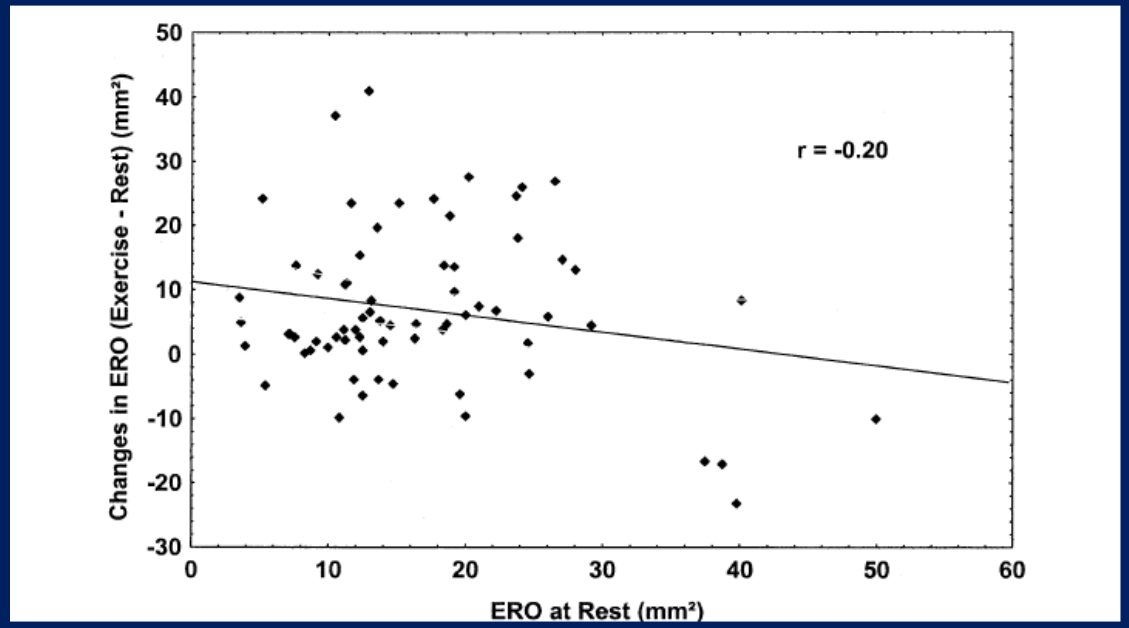
Guidelines ESC 2025

moderate ischaemic SMR

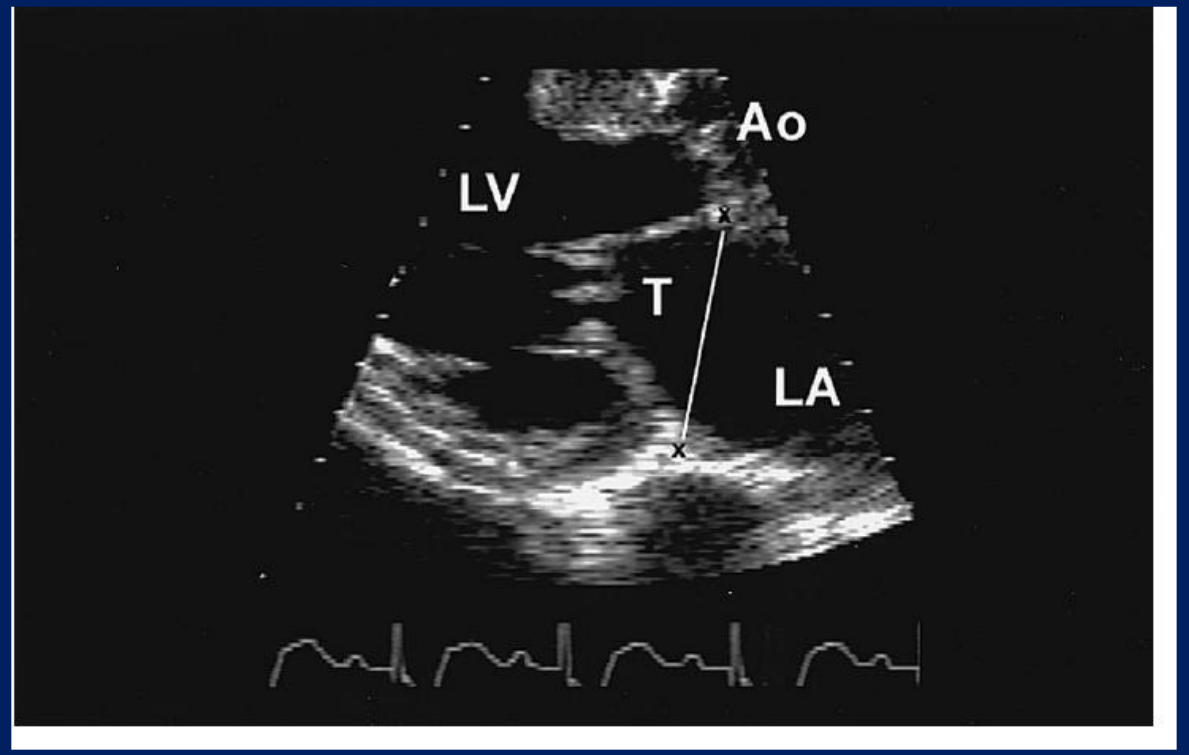
low. Exercise-induced dyspnoea and a large increase in mitral regurgitation severity and SPAP favour combined surgery.

Guidelines ESC 2021

Pas de corrélation avec
Localisation IDM
Degré de l'IM au repos
FEVG



Lancelotti JACC 2003



Tenting : déplacement systolique des feuilles mitraux
Avec défaut de coaptation

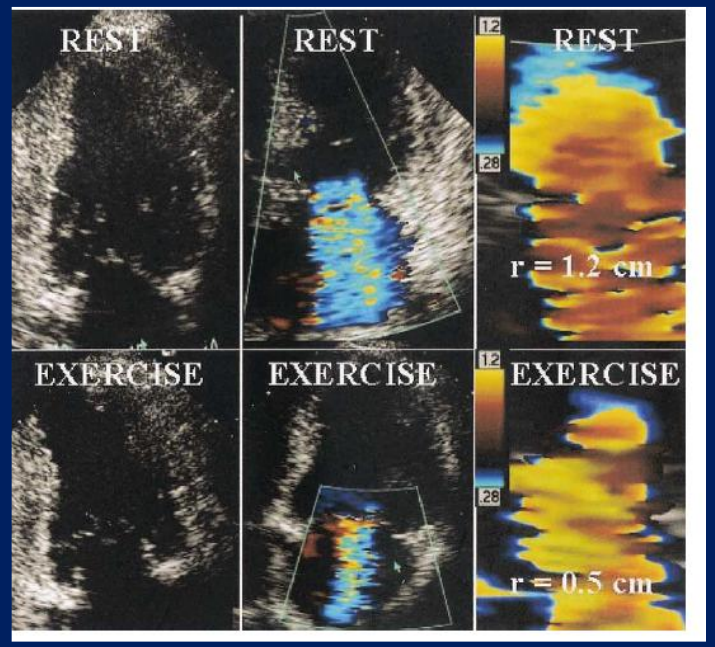
Siu F Yiu circu 2000

IM ischémiques à l'effort : mécanismes

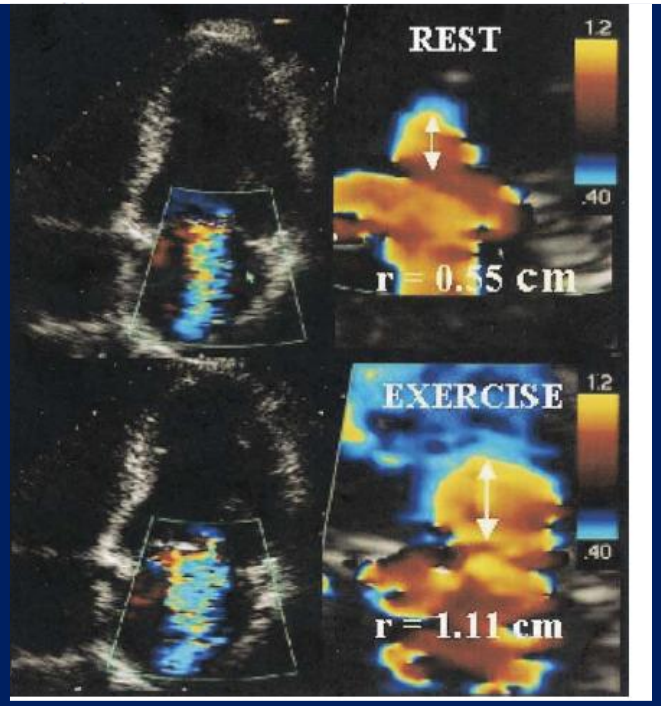
70 pts IM≥2 FEVG<45% a l'effort
↑ SOR <13 mm2 : 38 pts
↑SOR >13 mm2 : 19 pts
↓SOR : 13 pts

Table 4. Determinants of the ERO Changes During Exercise

Data	ERO at Exercise		
	Total	Anterior	Inferior
Tenting area	0.000001	—	0.000004
Coaptation height	—	0.00002	—
Systolic MA area	0.0009	0.006	0.034
WMI	0.019	—	0.009
R^2	0.79	0.85	0.86



Lancelotti JACC 2003



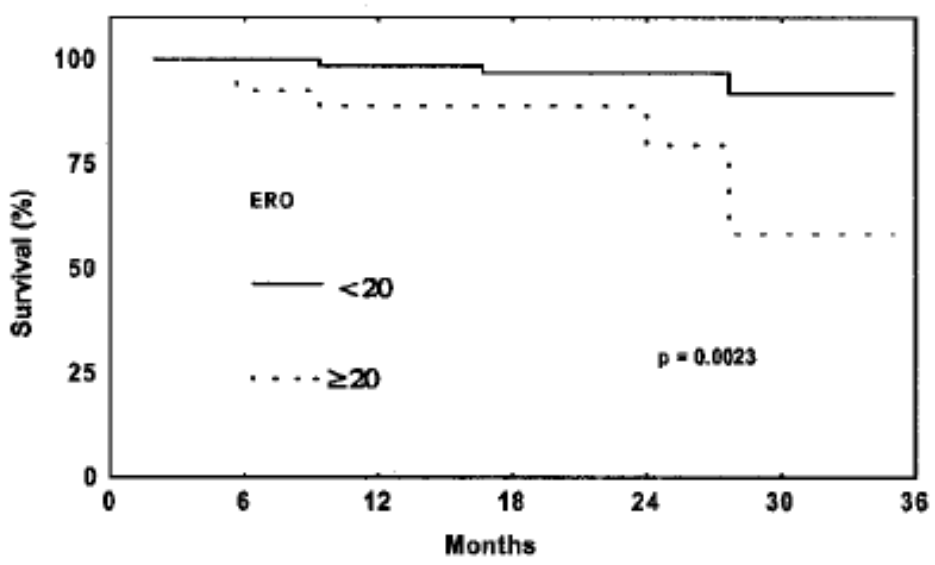
Diminution IM isch inf avec amélioration de la cinétique

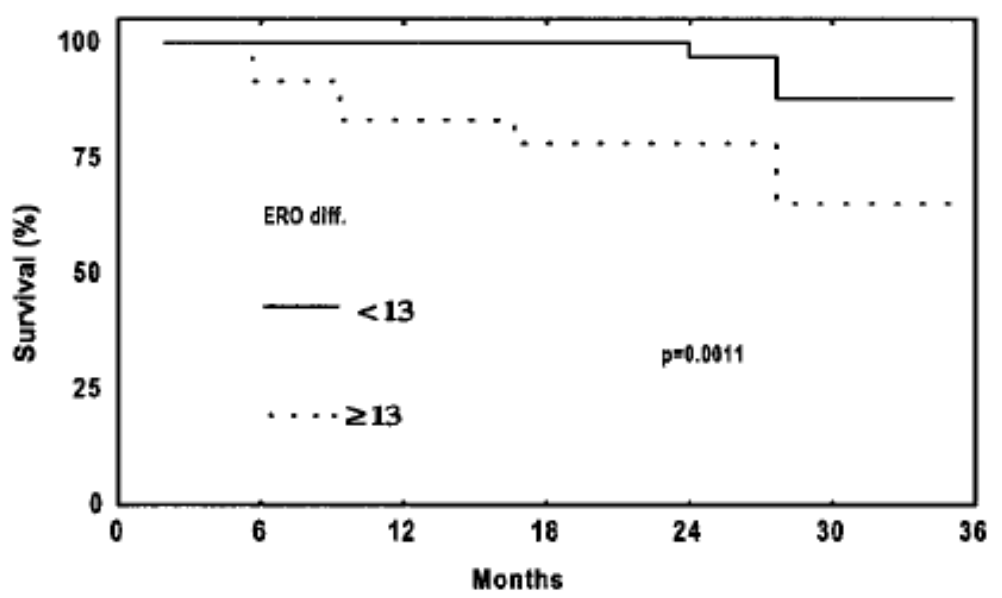
augmentation IM isch ant avec déplacement ant des feuiilets

IM ischémique à l'effort : Pronostic a court terme

TABLE 3. Multivariate Predictors of Mortality

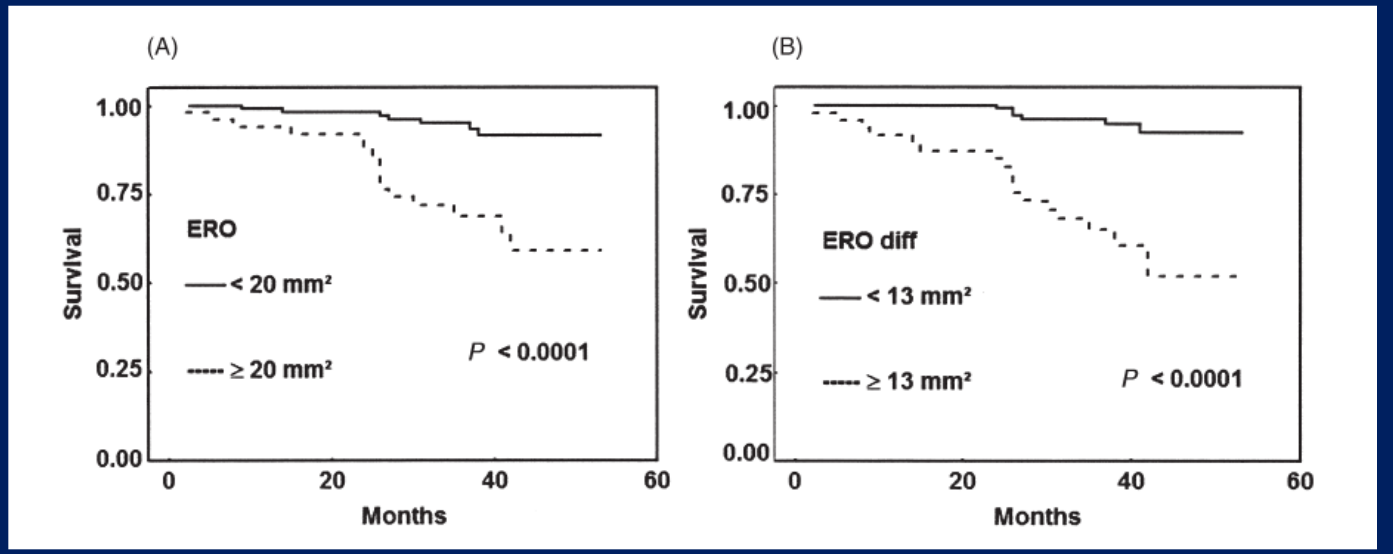
	χ^2	*P*
ERO difference ≥13 mm²	8.1	0.0045
ERO ≥20 mm²	6.0	0.01
Mitral deceleration time	3.9	0.044



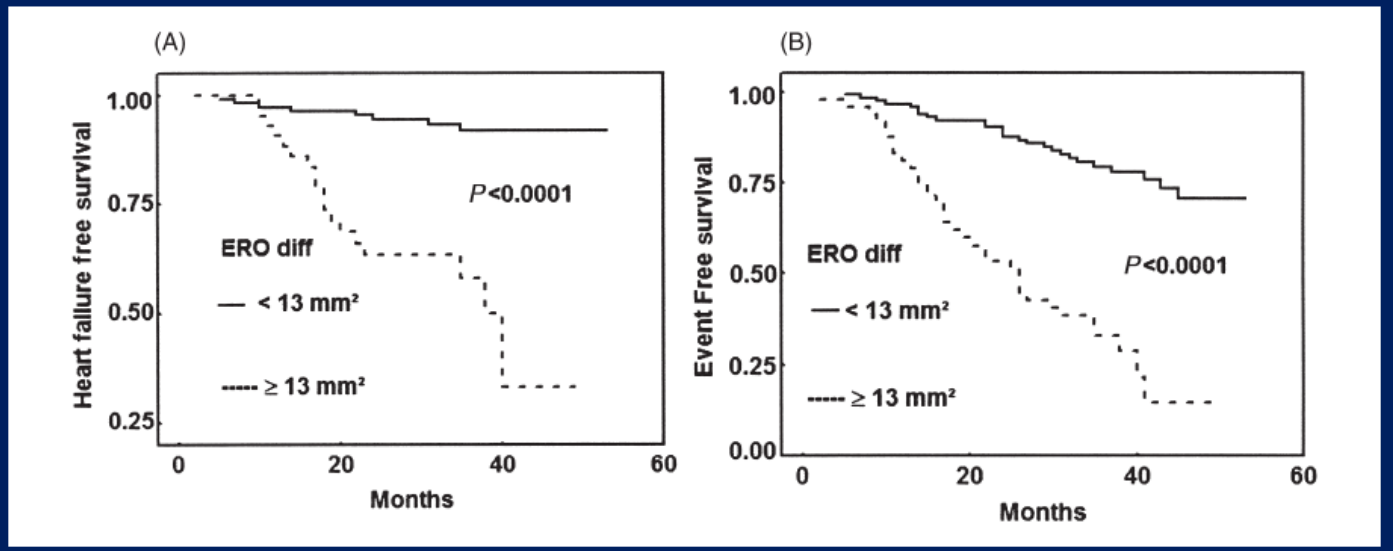


Lancelotti P circu 2003

IM ischémique à l'effort : Pronostic à long terme



Lancelotti EHJ 2005



A hosp pour IC

B evt cardiaque majeur

INDICATIONS (Lancelloti)

- Disproportion symptômes / IM et dysfonction VG
- CMI avec OAP inexpliqués
- CMI avec IM ischémique modérée avant revascularisation notamment chirurgicale

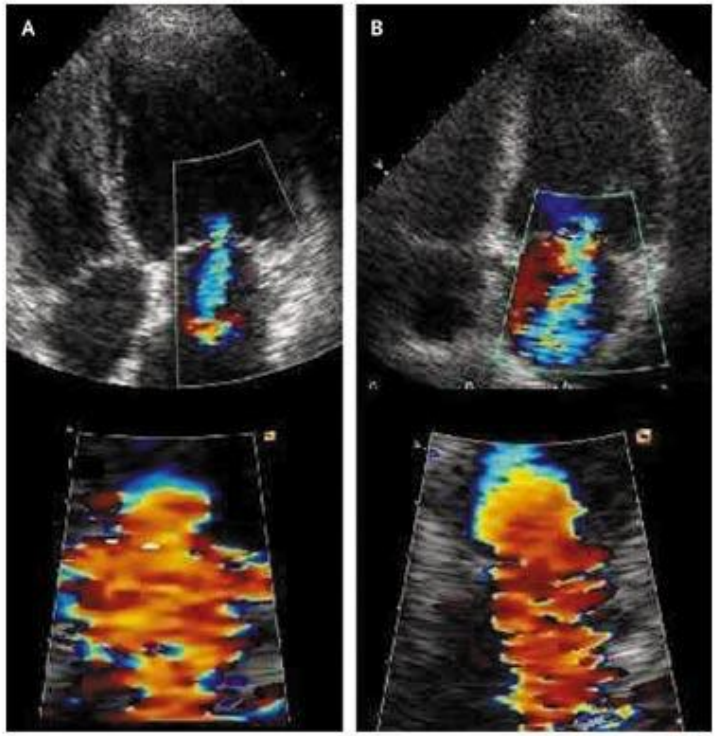
OAP ischémique

28 pts OAP ischémique/ 46 « controles »

Table 2. Exercise-Induced Changes in Hemodynamic and Doppler Echocardiographic Variables.*

Variable	Pulmonary Edema (N=28)	No Pulmonary Edema (N=46)	P Value
Systolic arterial pressure (mm Hg)	+26±19	+27±18	0.65
Heart rate (beats/min)	+39±10	+37±17	0.15
Left ventricular end-diastolic volume (ml/m²)	−0.25±20	−1.3±19	0.25
Left ventricular end-systolic volume (ml/m²)	−6.8±16	−15±19	0.06
Left ventricular ejection fraction (%)	+5.4±4.3	+9.7±7.5	0.002
Left atrial area (cm²)	+1.42±3.2	+0.96±3.7	0.57
Tenting area (cm²)	+1.5±1.4	+0.14±1.3	0.001
Left ventricular wall-motion index	−0.25±0.20	−0.30±0.20	0.02
Regurgitant volume (ml)	+26±14	+5±14	<0.001
Effective regurgitant orifice area (mm²)	+16±10	+2±9	<0.001
Transtricuspid pressure gradient (mm Hg)	+29±10	+13±11	<0.001

* Plus–minus values are means ±SD.



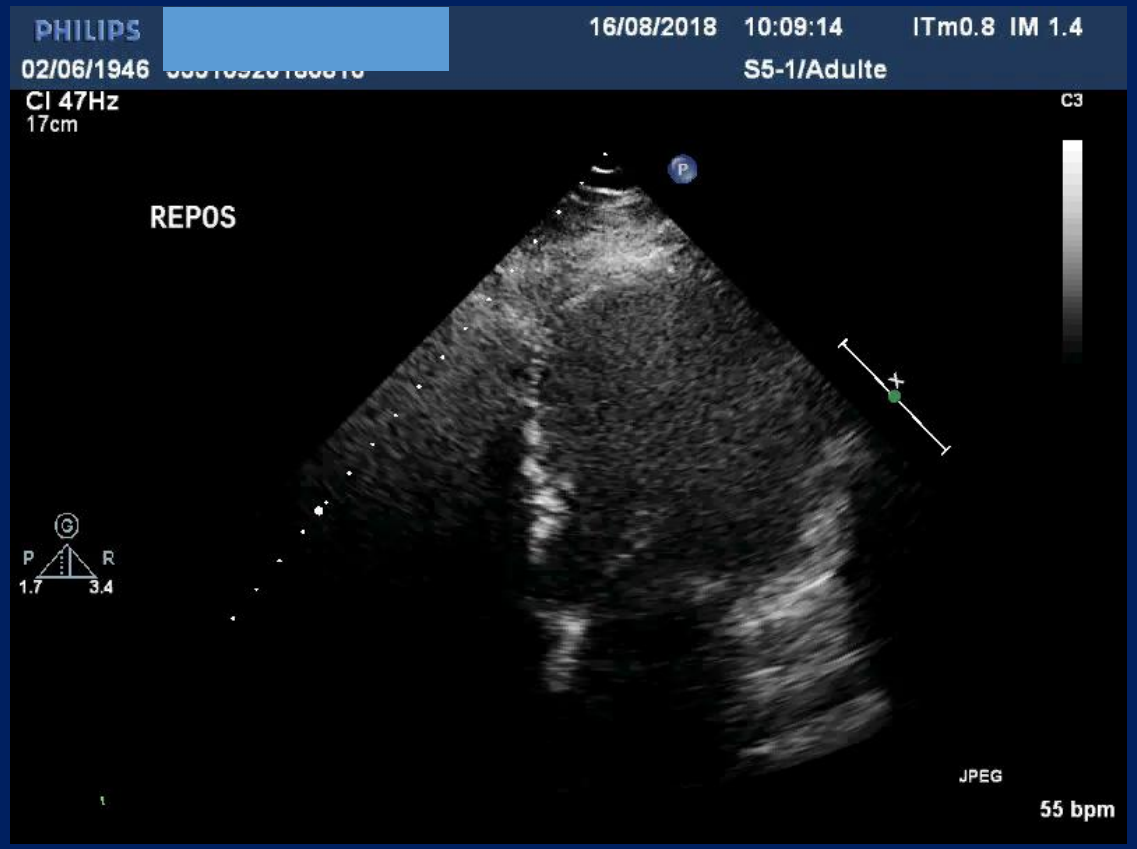
Lancelotti P, N Engl J Med 2004

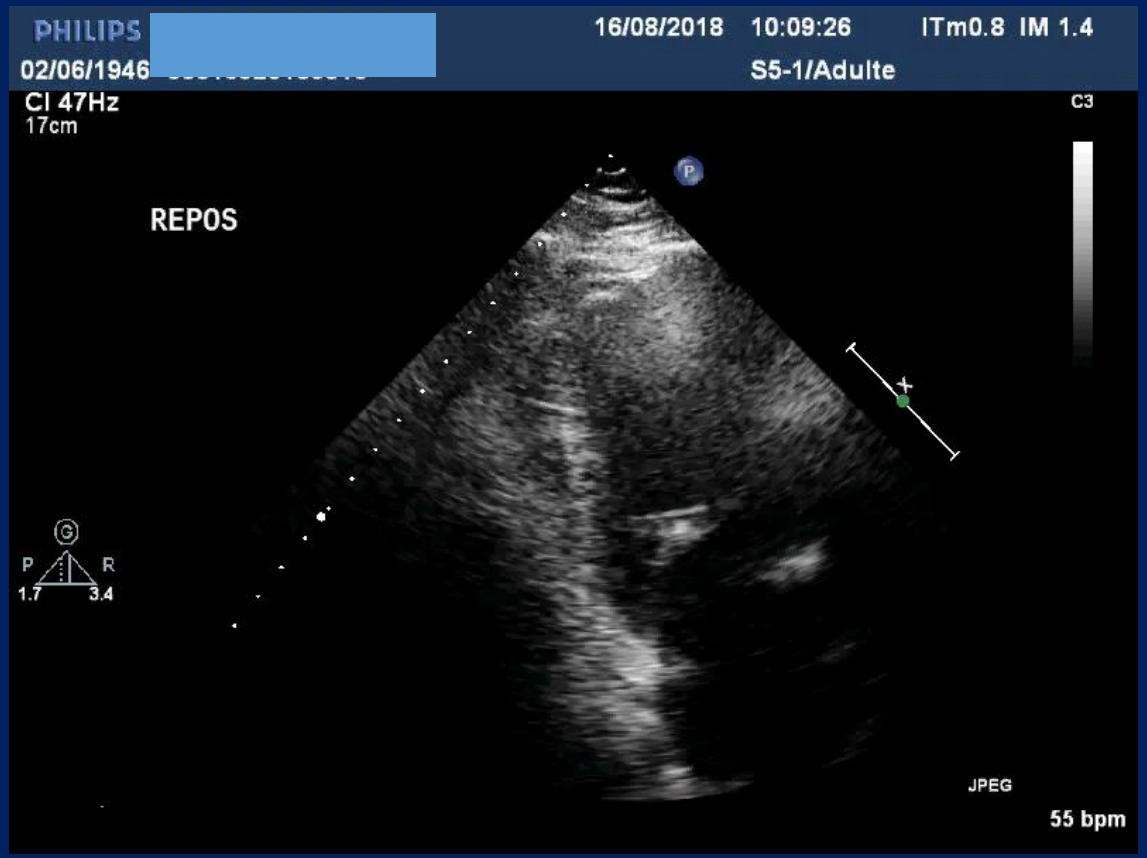
- Homme 72 ans
- CMI PAC 2008 MIG IVA-Mg occlusion rapide PAC Mg
- Ablation de FA 2016 sous cardensiel 1.25 + cordarone 1/j lasilix
- FEVG 40-45% IM ischémique modérée à moyenne
- + 10kg en 1 an
- Adressé en réadapt dyspnée Stade II+ (gêné aussi quand il fait ses lacets)
- ECG BBG BNP 400pg/ml
- EE neg 94W FC 60 à 72/min

Étiologie de dyspnée

- Surpoids
- Insuffisance chronotrope
- Insuffisance mitrale
  - IM ischémique
  - Asynchronisme

- CAT
  - Arret cordarone
  - Echo d’effort


PHILIPS
16/08/2018 10:09:14 ITm0.8 IM 1.4
02/06/1946
S5-1/Adulte
CI 47Hz
17cm
C3
REPOS
P
G
P R
1.7 3.4
JPEG
55 bpm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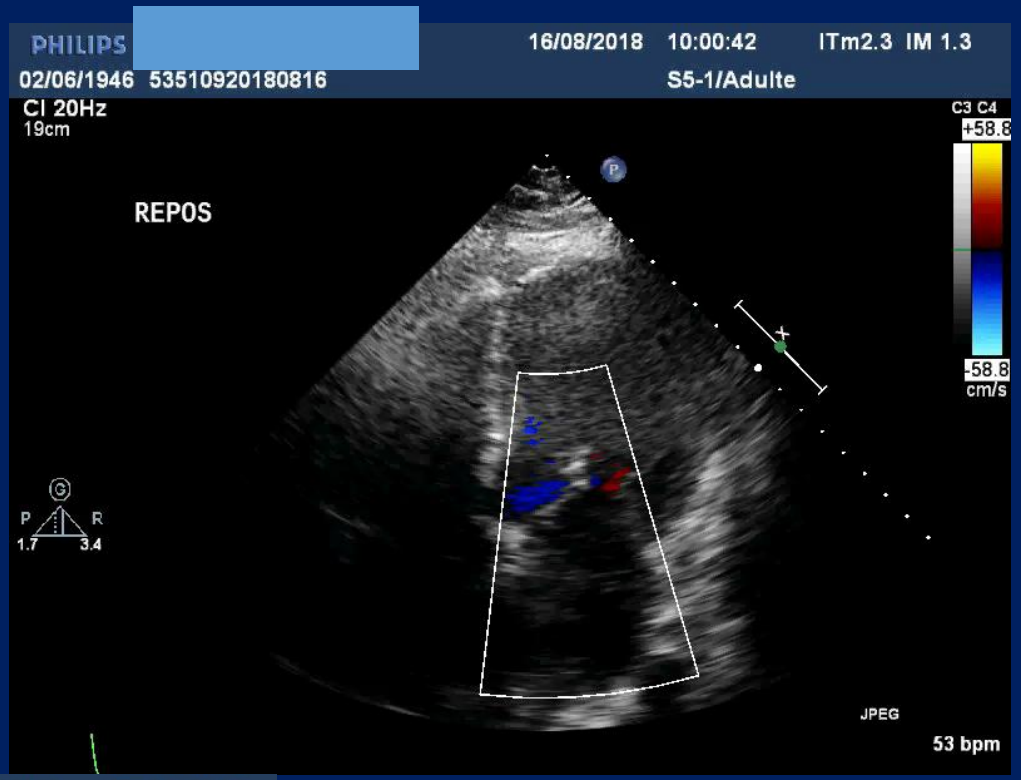
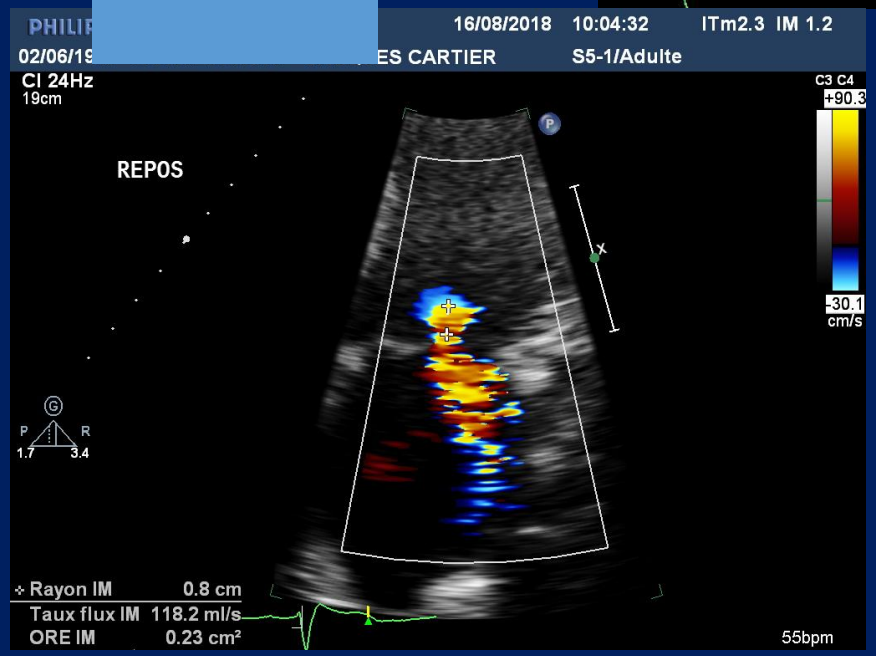
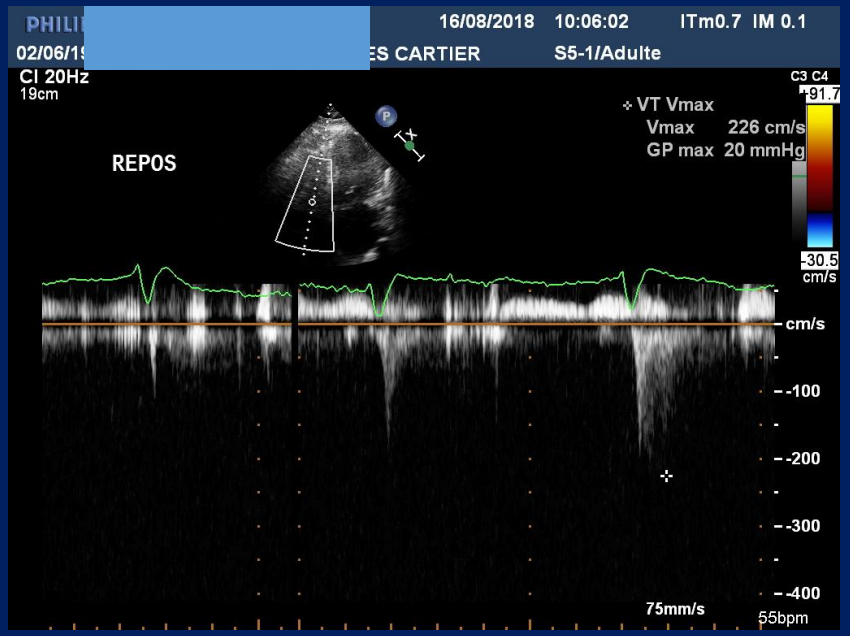
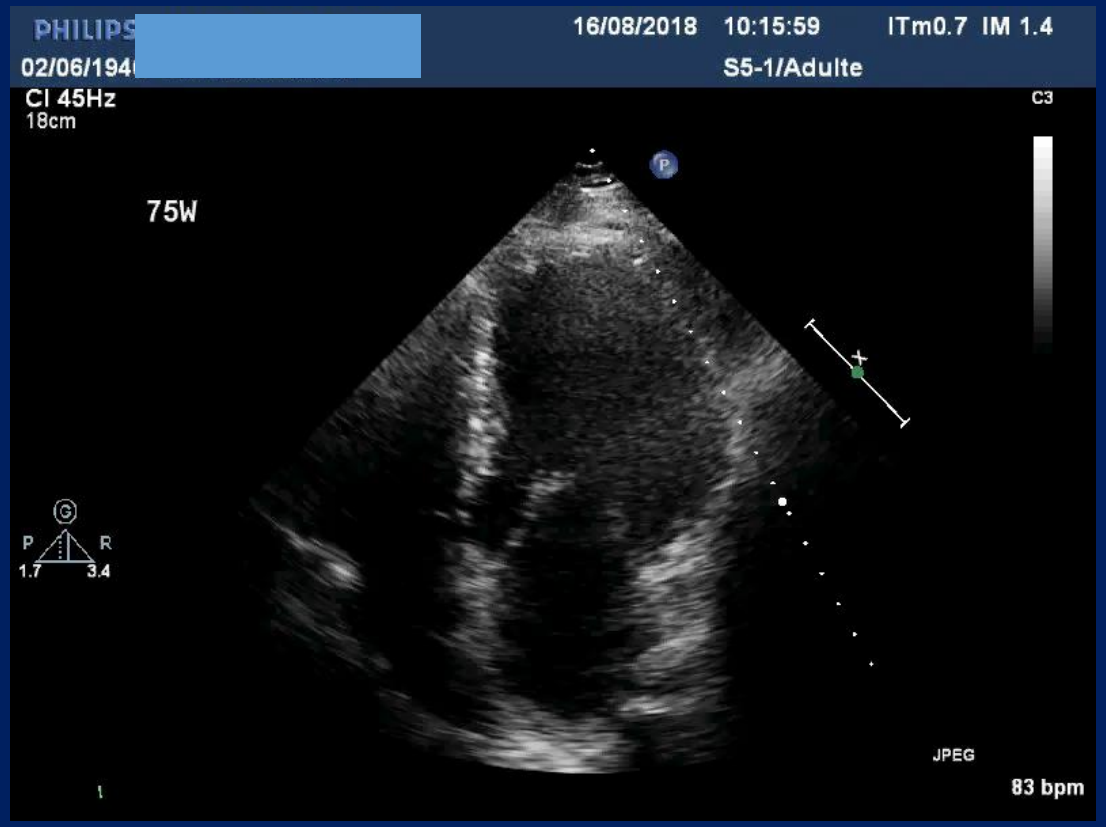
02/06/1946
S5-1/Adulte
CI 47Hz
17cm
C3
REPOS
P
G
P R
1.7 3.4
JPEG
55 bpm

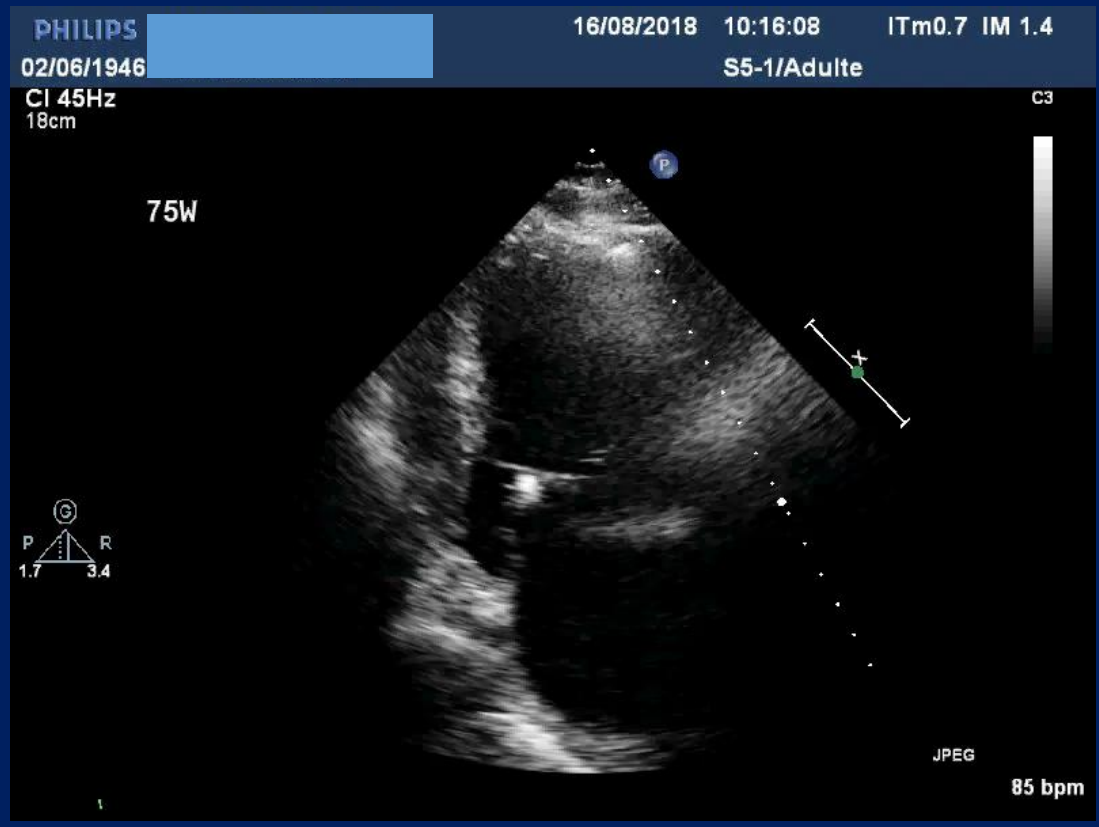

PHILIPS
16/08/2018 10:00:42 ITm2.3 IM 1.3
02/06/1946 53510920180816
S5-1/Adulte
CI 20Hz
19cm
C3 C4
+58.8
REPOS
-58.8
cm/s
P R
1.7 3.4
JPEG
53 bpm


16/08/2018 10:04:32 ITm2.3 IM 1.2
ES CARTIER
S5-1/Adulte
CI 24Hz
19cm
C3 C4
+90.3
REPOS
-30.1
cm/s
P R
1.7 3.4
Rayon IM 0.8 cm
Taux flux IM 118.2 ml/s
ORE IM 0.23 cm²
55bpm

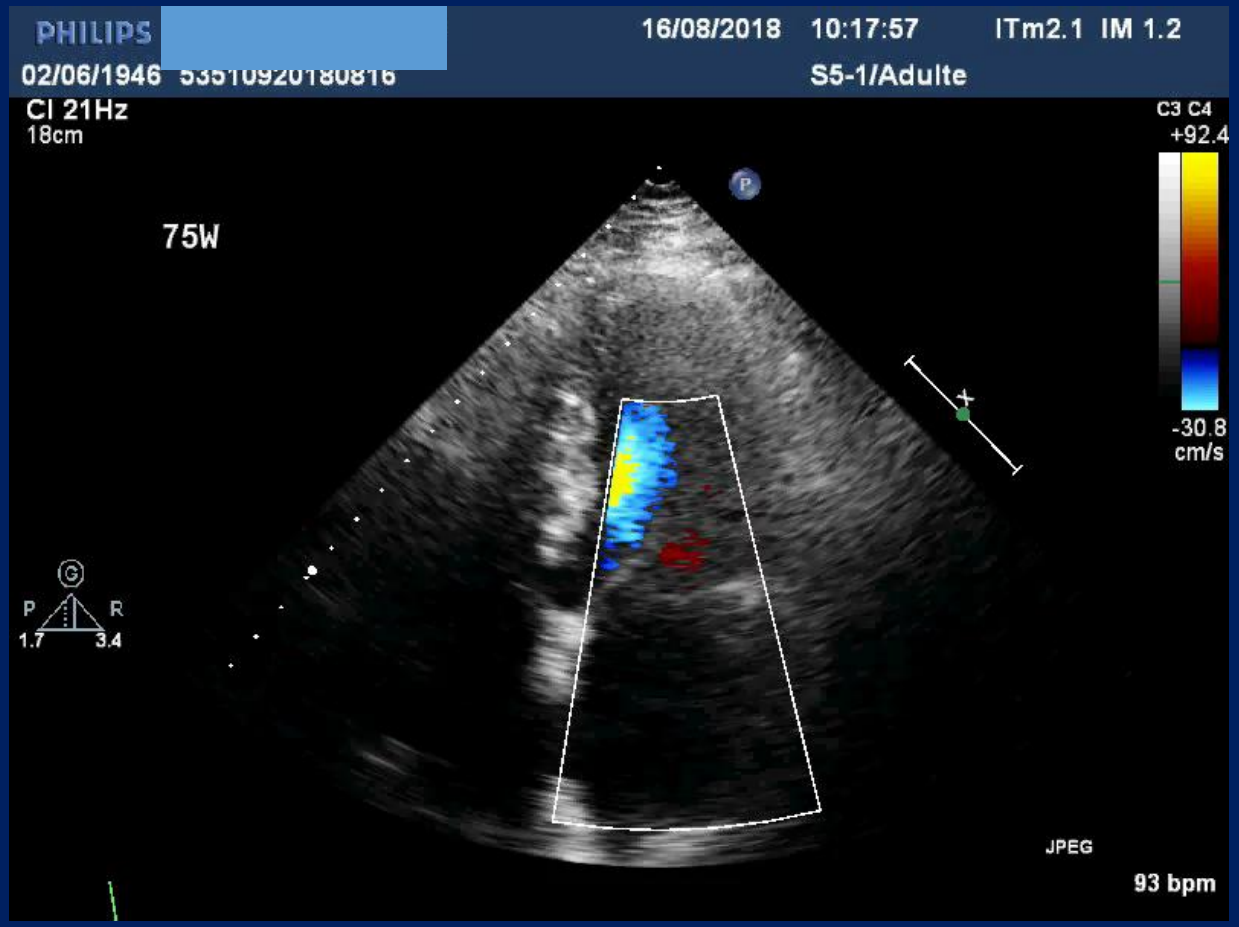

16/08/2018 10:06:02 ITm0.7 IM 0.1
ES CARTIER
S5-1/Adulte
CI 20Hz
19cm
C3 C4
+91.7
VT Vmax
Vmax 226 cm/s
GP max 20 mmHg
REPOS
-30.5
cm/s
cm/s
-100
-200
-300
-400
75mm/s
55bpm

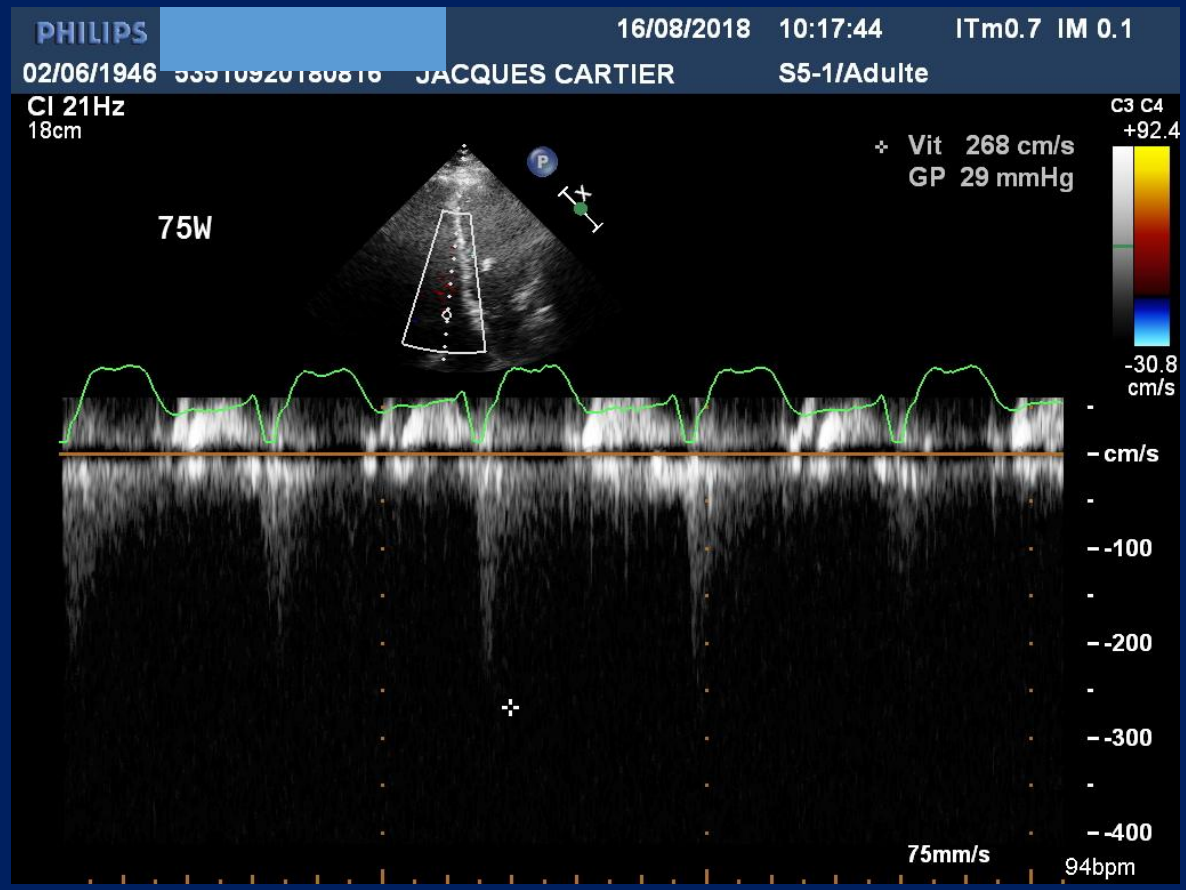
Echo d’effort





EE neg 75W 63% de la FMT (Fc max 93/min) Pas max 150 mmHg


PHILIPS
16/08/2018 10:17:57 ITm2.1 IM 1.2
02/06/1946
S5-1/Adulte
CI 21Hz
18cm
C3 C4
+92.4
75W
-30.8
cm/s
P
R
1.7
3.4
JPEG
93 bpm


PHILIPS
16/08/2018 10:17:44 ITm0.7 IM 0.1
02/06/1946
JACQUES CARTIER
S5-1/Adulte
CI 21Hz
18cm
C3 C4
+92.4
Vit 268 cm/s
GP 29 mmHg
75W
-30.8
cm/s
cm/s
-100
-200
-300
-400
75mm/s
94bpm

Evolution

- Perte de 3kg pendant le séjour amélioration de la réserve chronotrope
- Amélioration fonctionnelle

conclusion

- Valvulopathie aortique
  - IA pas d'indication
  - RAC pas de valeur ajoutée echo d'effort /EE (VO2)

- Valvulopathie mitrale
  - RM discordance clinique/symptomes
  - IM primitive discordance clinique/symptomes
  - IM secondaire
    - discordance clinique/symptomes
    - Avant revascularisation
    - OAP flash