



## *Session Aorte, Sport et Valvulopathies*

# **PVM et sport: Une situation particulière**



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# **Déclaration de conflits d'intérêts**

**Aucun**

Cas Clinique: RS, 33 ans, 1,52m pr 46 kg, télétravail  
vélo 80-150 km/j 6x/sem + jour de repos = 20 Km CàP ! ...

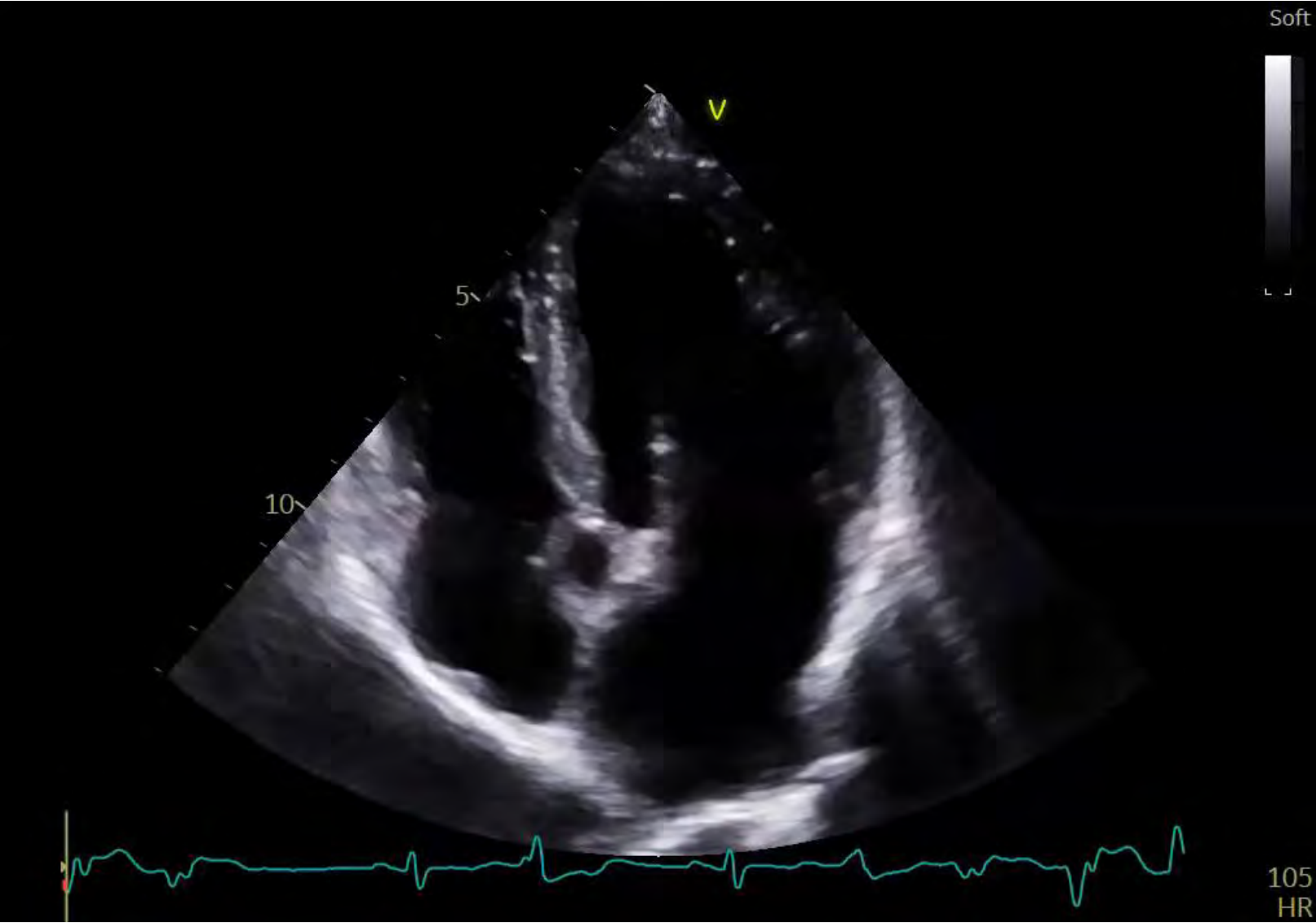
Asymptomatique, consulte pour un certificat d'absence de contre-indication.  
Découverte d'une arythmie à l'auscultation, petit souffle 1/6  
> Demande avis cardio (juin 2022)



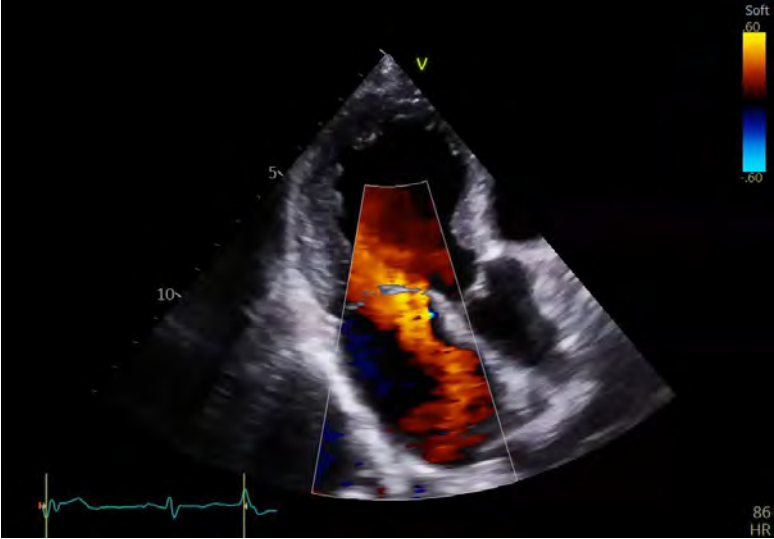
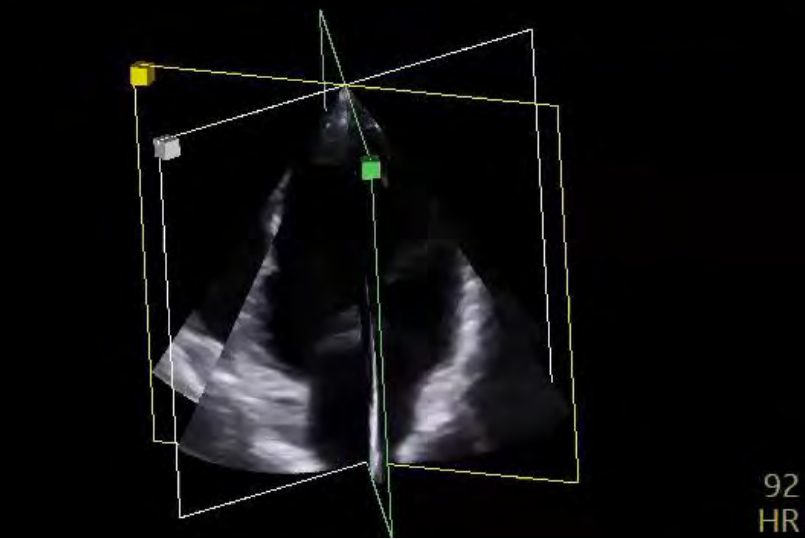
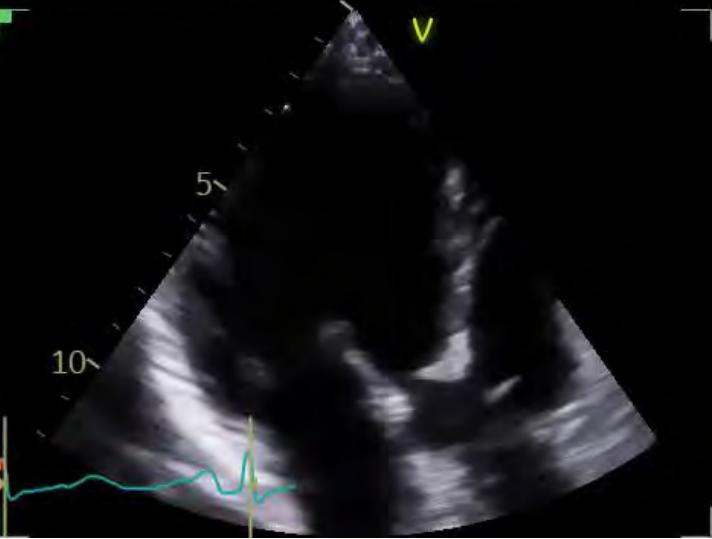
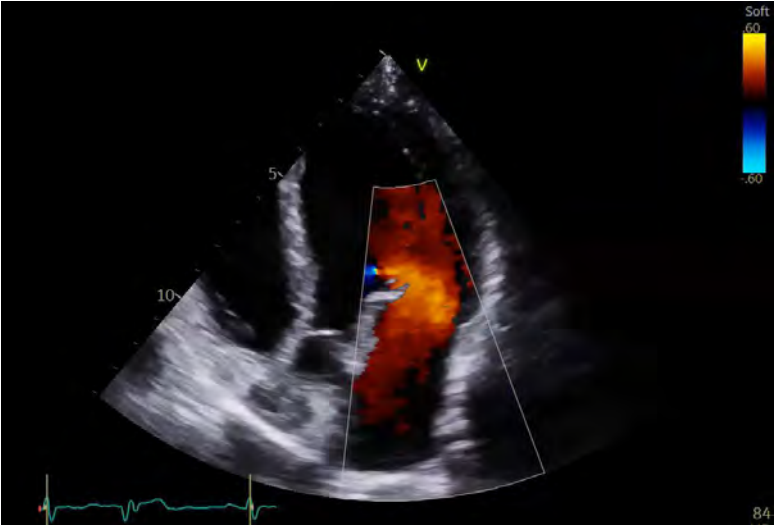
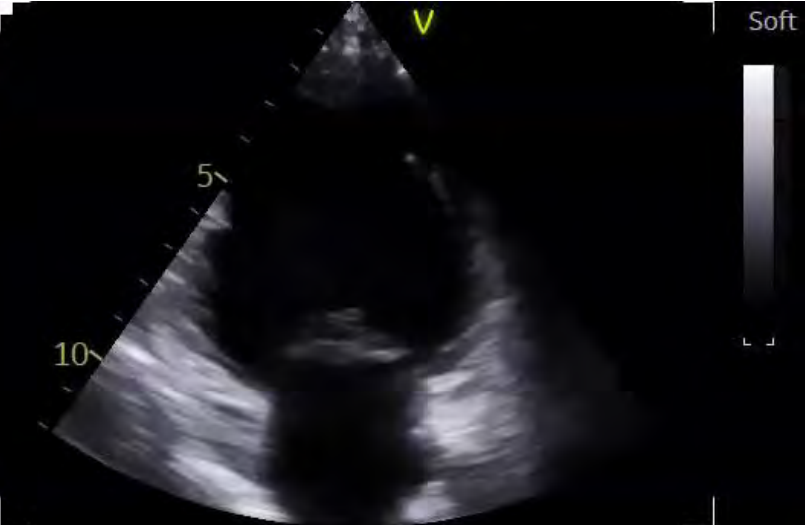
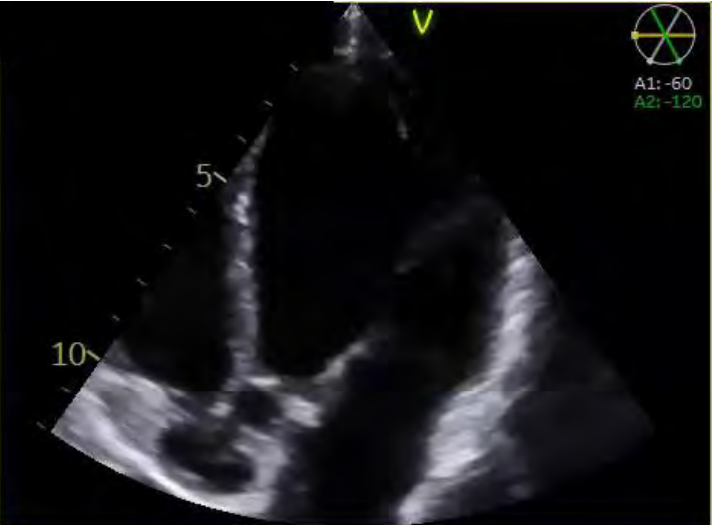
*Axe inférieur G :*

- DII - et DIII -
- retard droit V1
- = Pilier postéro-médian :
- pseudo onde delta
- $R < S$  en V5-V6
- aspect Rsr' , R ou qR en V1

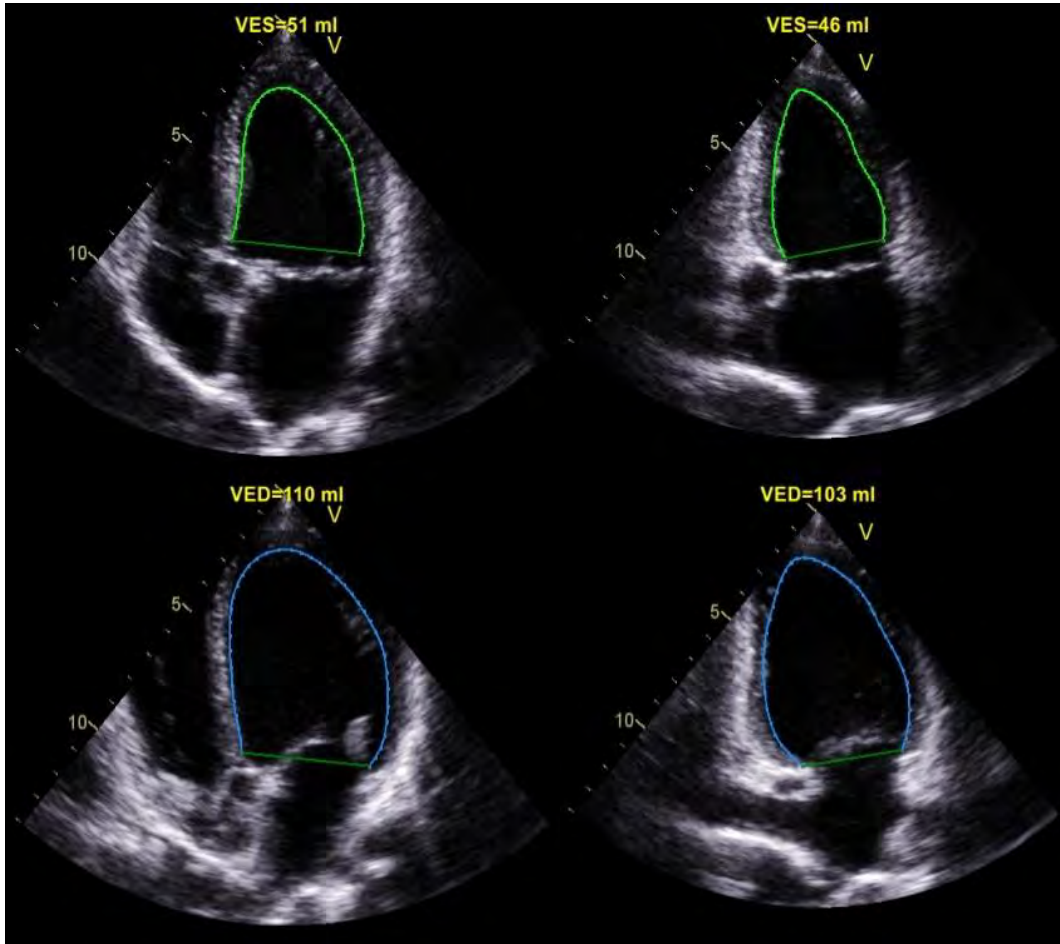
# Echocoeur initiale



# Echocoeur initiale

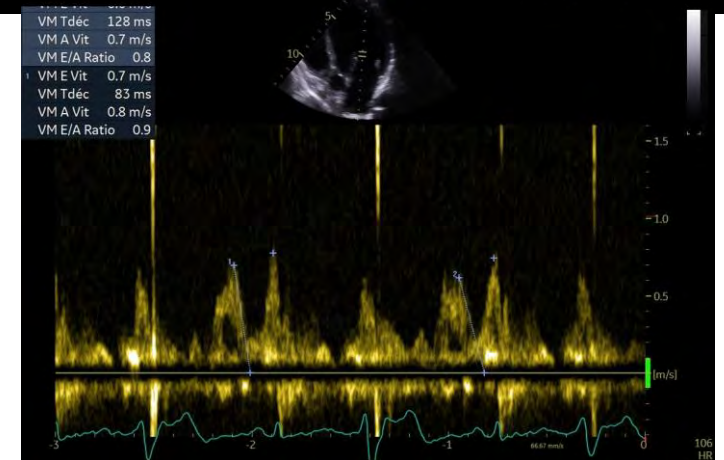
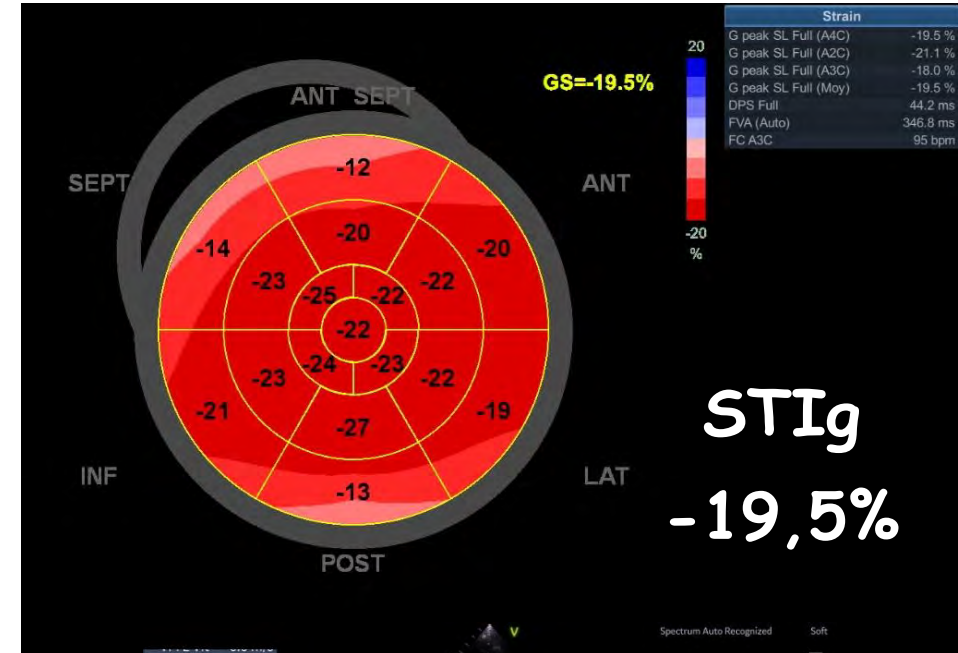


# Echocoeur initiale

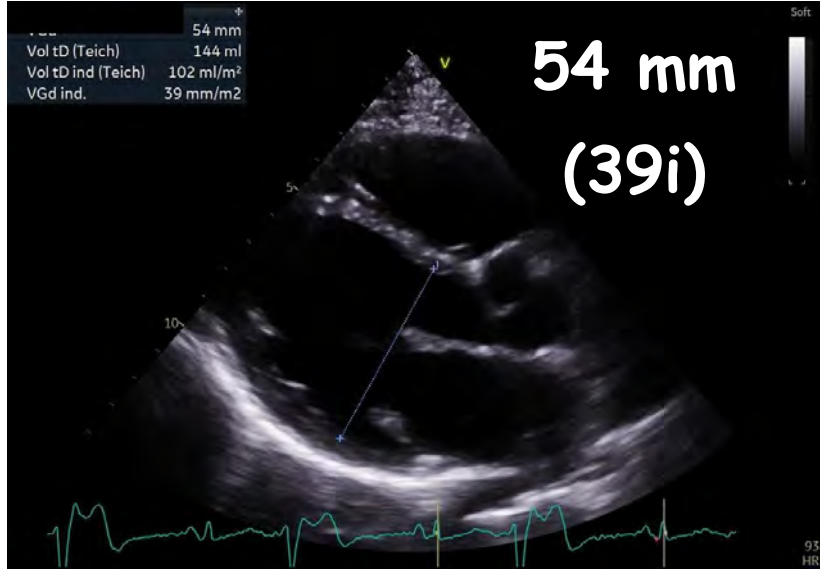
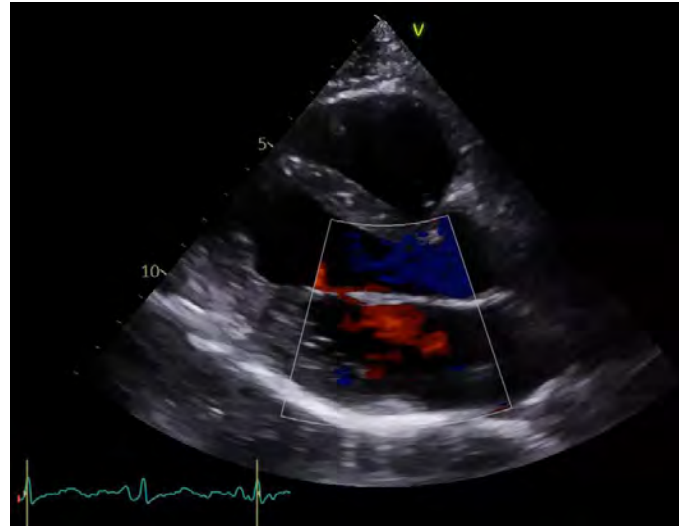
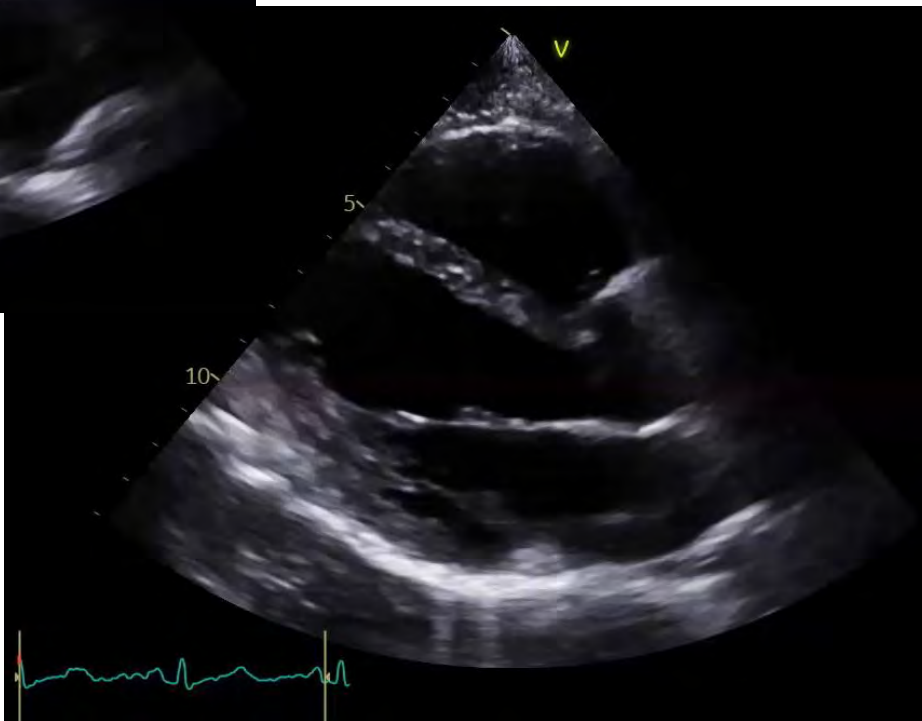
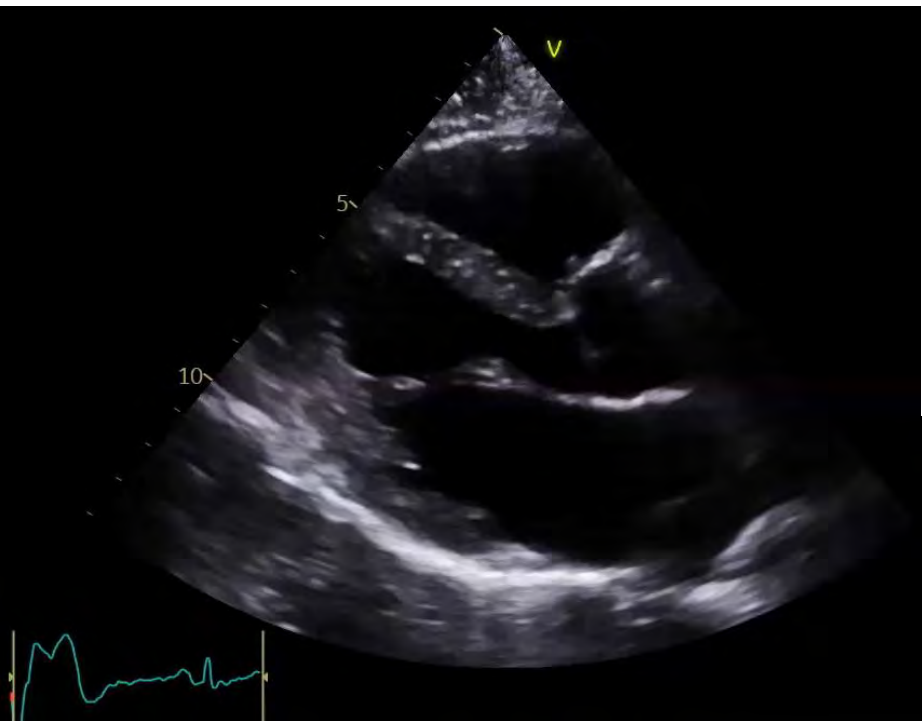


FE	
VGVES A2C	46 ml
VGVED A2C	103 ml
VGVéjec A2C	57 ml
VGFE A2C	56 %
VGLs A2C	5.7 cm
VGLd A2C	7.3 cm
FC A2C	130 bpm
VGDébit Card. A2C	7.4 l/min
VGVES A4C	51 ml
VGVED A4C	110 ml
VGVéjec A4C	59 ml
VGFE A4C	54 %
VGLs A4C	5.1 cm
VGLd A4C	6.8 cm
FC A4C	133 bpm
VGDébit Card. A4C	7.9 l/min
VGVES BiP	46 ml
VGVED BiP	107 ml
VGVéjec BiP	60 ml
VGFE BiP	57 %
VGDébit Card. BiP	7.7 l/min

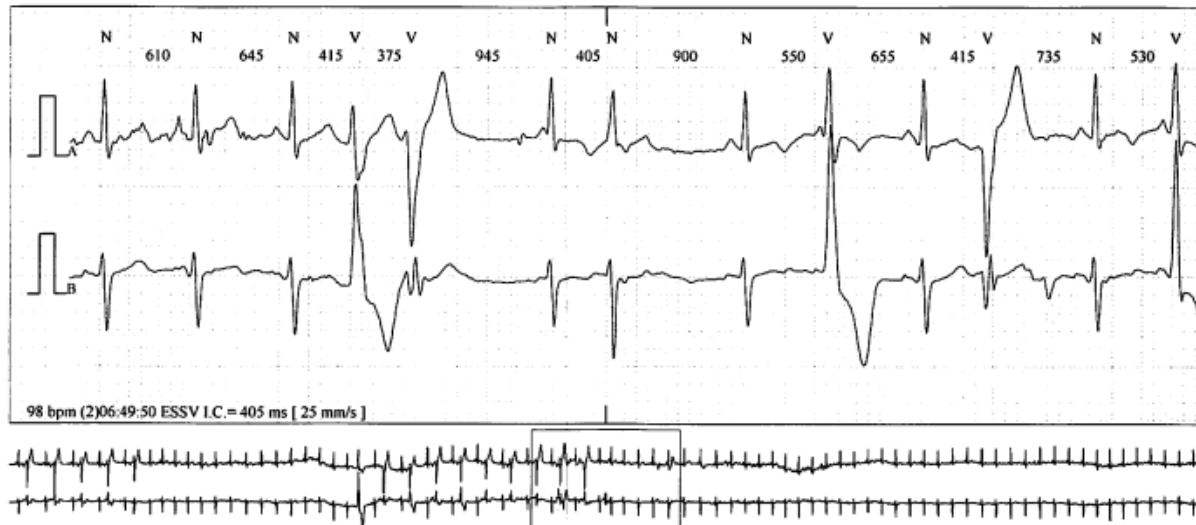
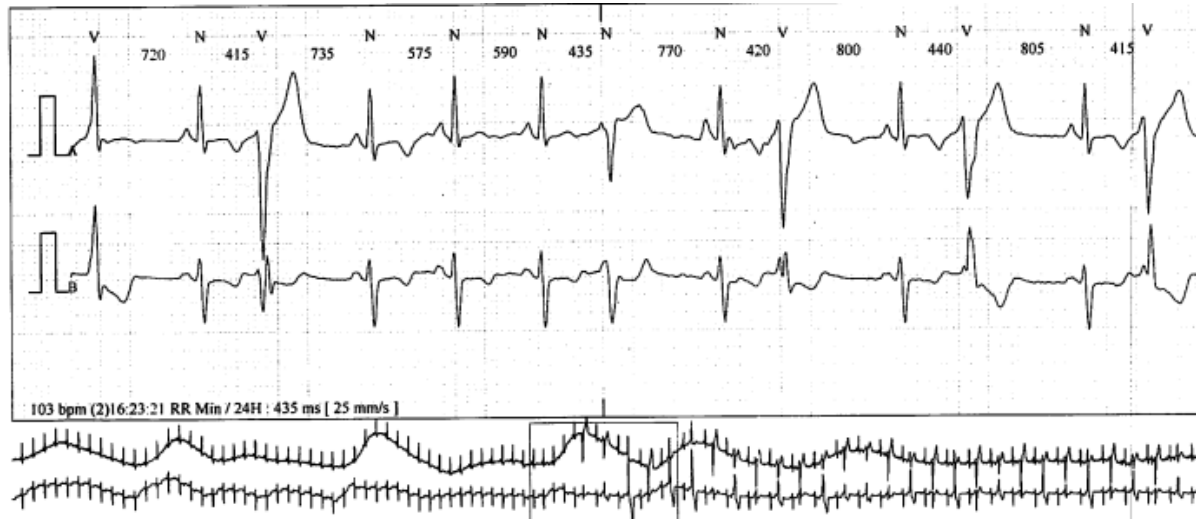
**FE VG 57%**



# Echocoeur initiale



# Holter ECG initial sans activité sportive



FC moyenne 72 bpm  
avec FC Min à 41

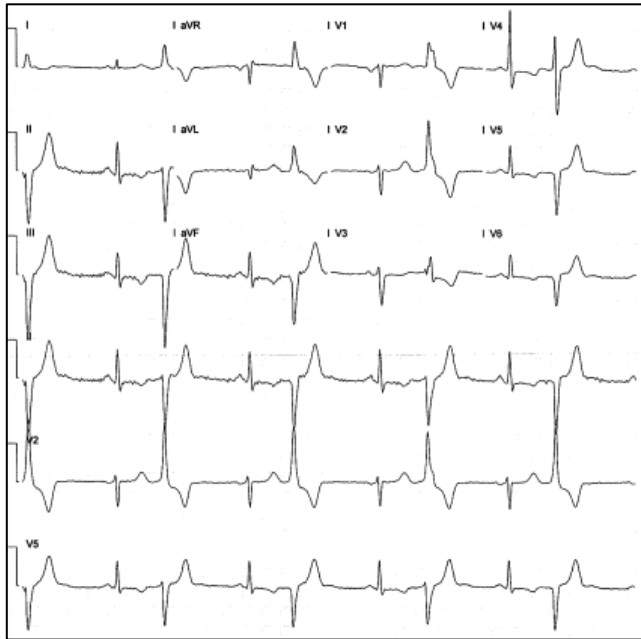
12 238 ESV / 48 heures, plusieurs  
doublets sans TSV soutenue

Proposition:

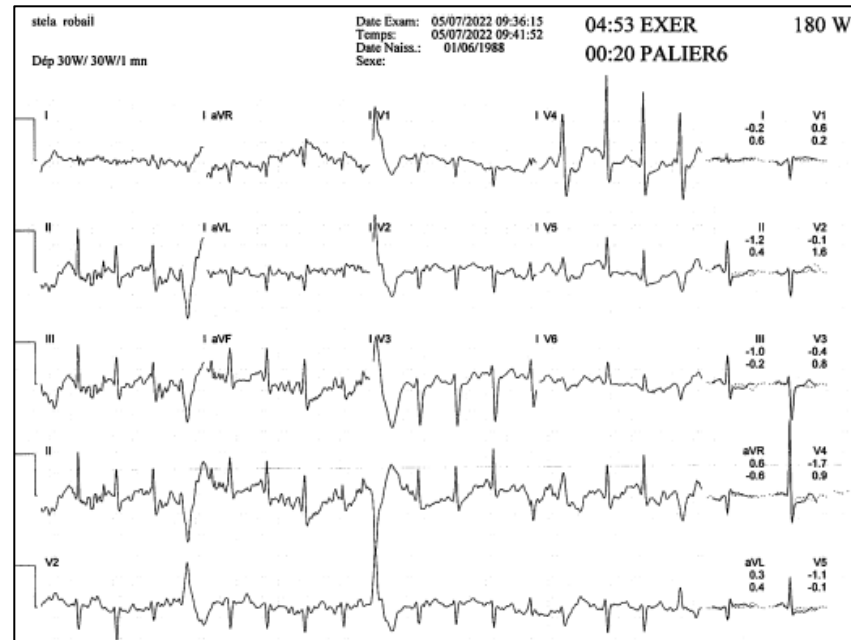
- > STOP APS le temps des explo<sup>o</sup> et plus déconditionnement
- Intro<sup>o</sup> Aténolol 50 1/2 et Ramipril
- indication IRM
- Discussion SVP ?

# Epreuve d'effort initiale

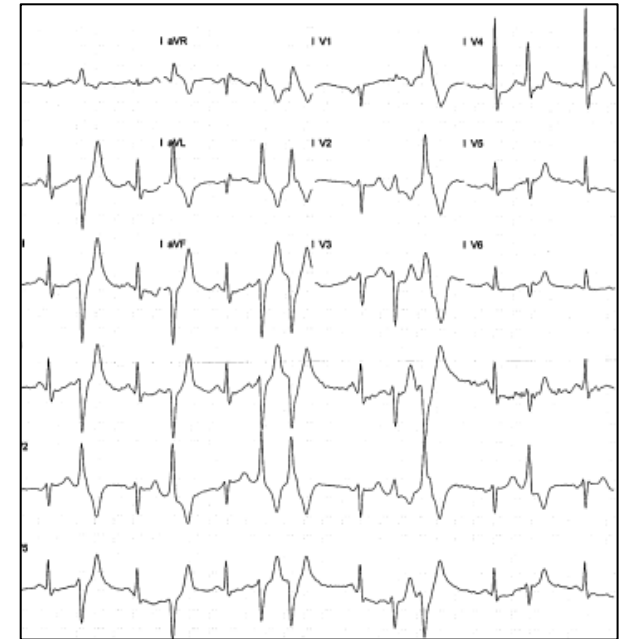
Repos



Pic effort



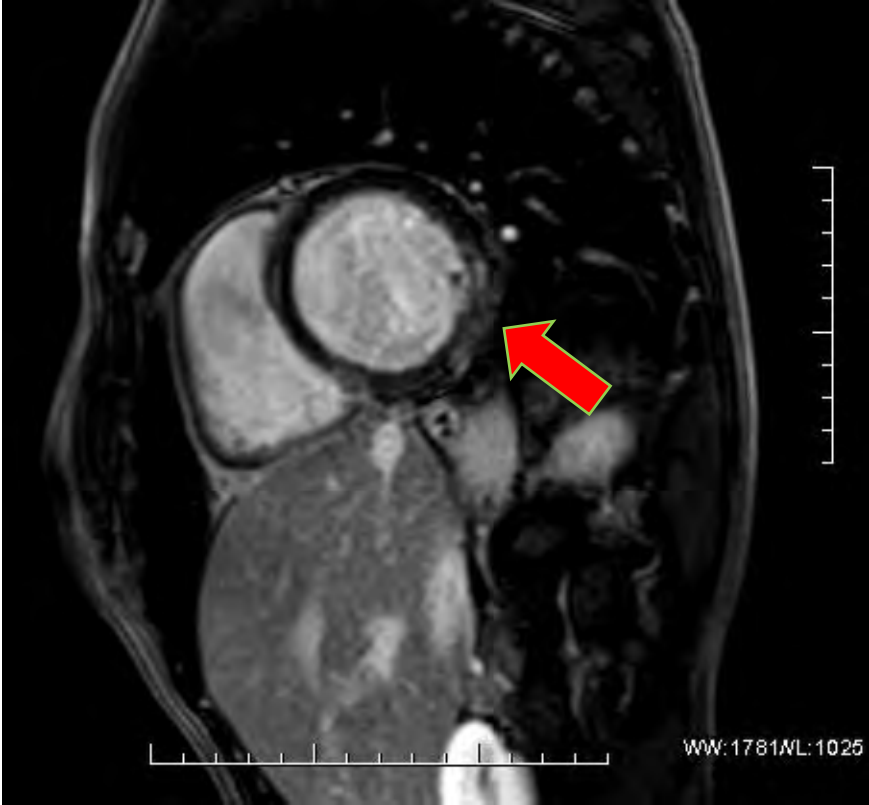
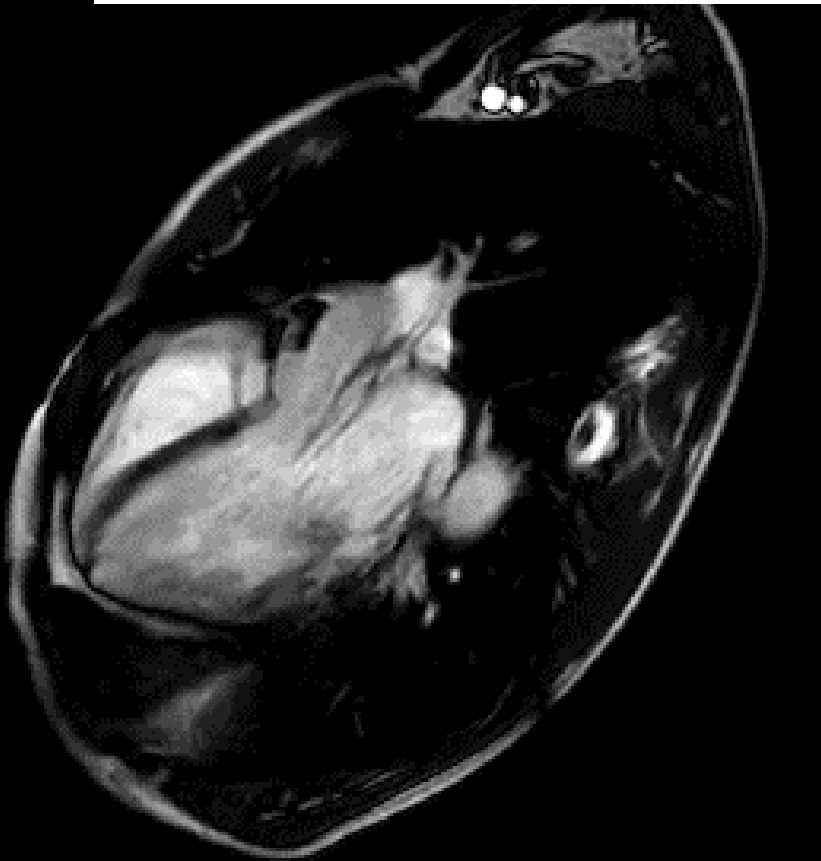
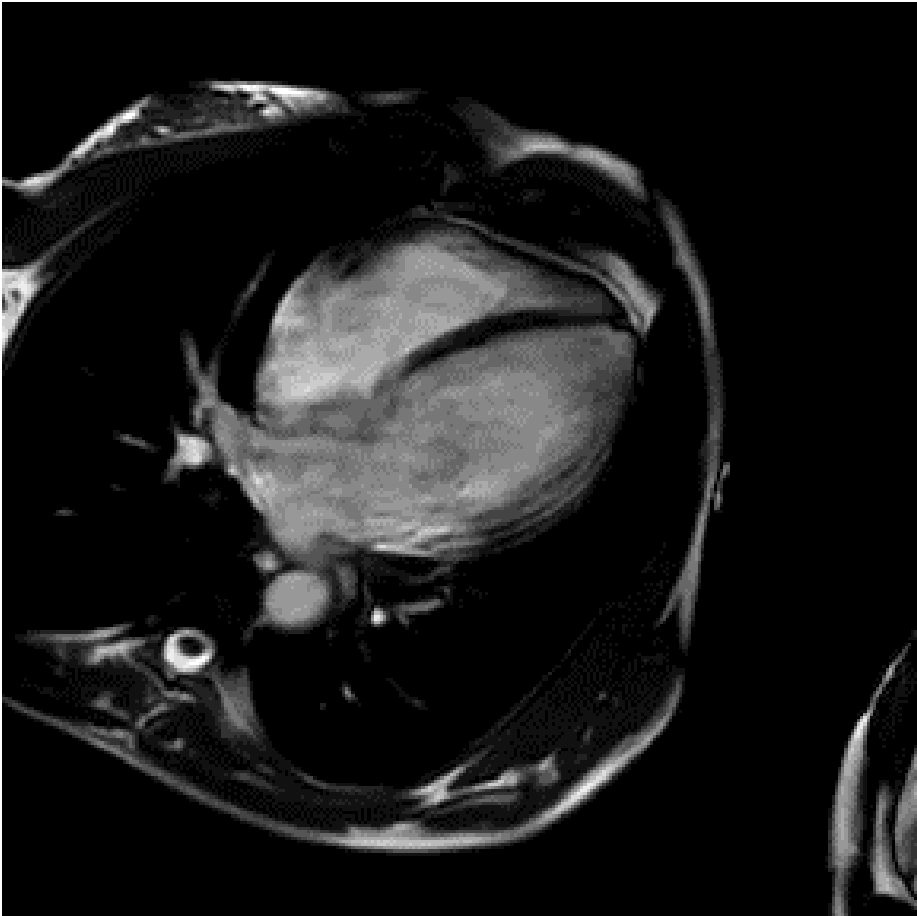
Récup°



Hyperexcitabilité ventriculaire non modifiée par l'effort  
Aténolol majoré à 50 mg/jour  
CMD ? CM rythmique ? Rôle du PVM avec DAM ?

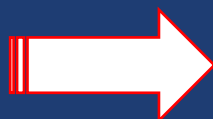
→ 3 mois de déconditionnement qui sont acceptés !!!

# IRM initiale

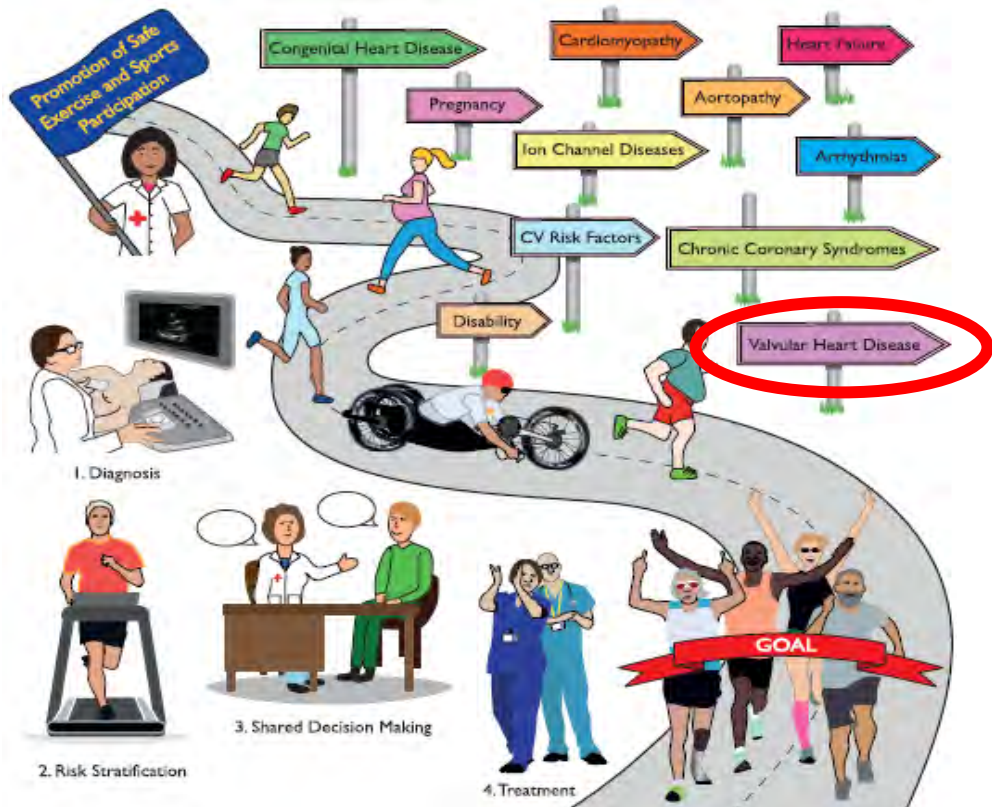


**RT = Fibrose**

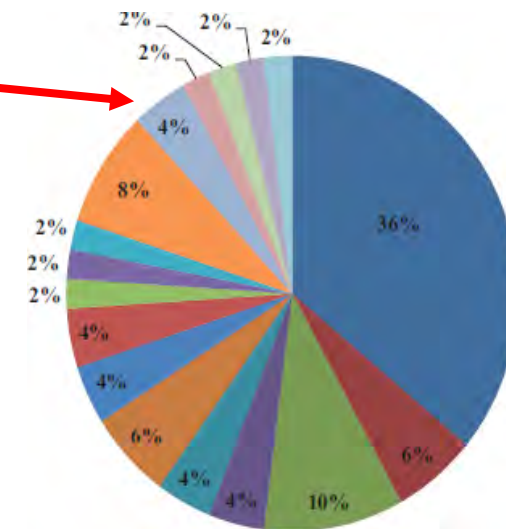
# Prolapsus mitral avec / sans fuite mitrale



# Que proposez-vous pour sa pratique sportive ???



- Unexplained
- Coronary heart disease
- HCM
- Possible HCM
- ARVD
- Congenital heart disease
- Dilated cardiomyopathy
- Myocarditis
- Early repolarization syndrome
- Wolff-Parkinson-White
- Long QT syndrome
- Primitive VF
- Mitral-valve prolapse
- Tunneled LAD coronary artery
- Commotio cordis
- Ruptured ascending aorta
- Epilepsy



Marijon Circ 2011

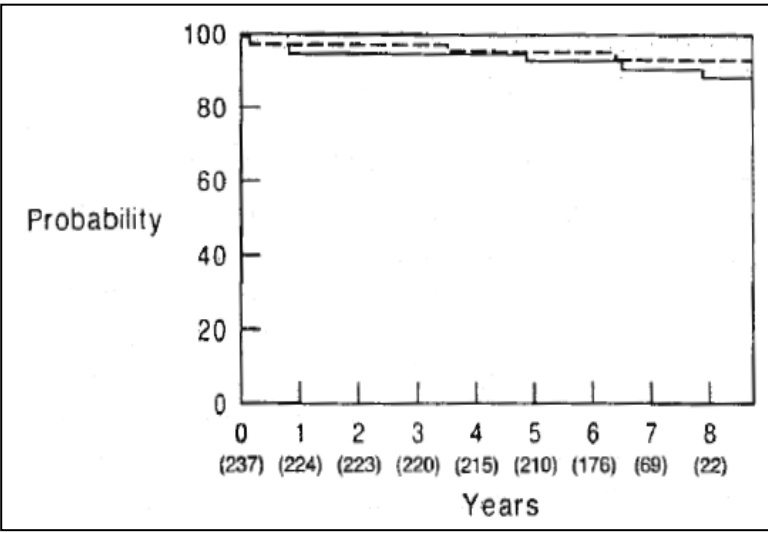


ESC European Heart Journal (2020) 00, 1–80  
European Society of Cardiology doi:10.1093/eurheartj/ehaa605

ESC GUIDELINES

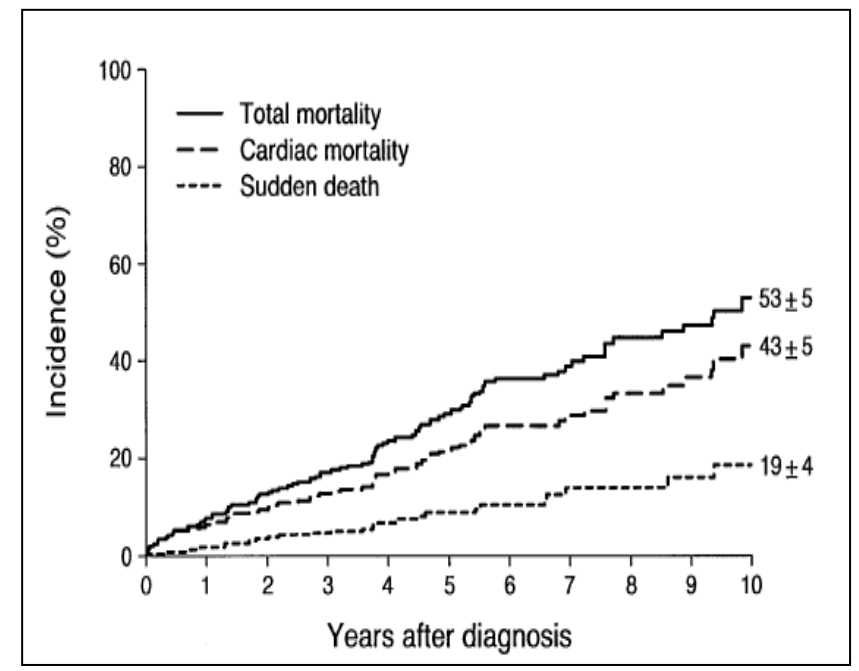
2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease

# PVM et Risque Cardio-Vasculaire (rythmique)

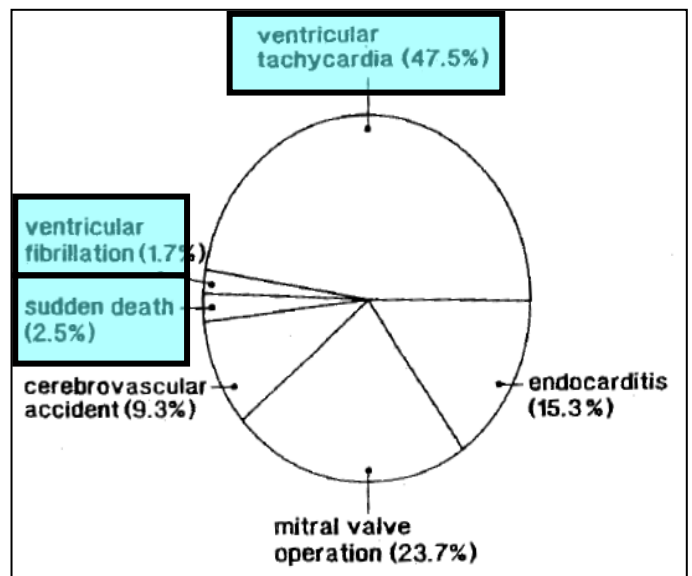


Nishimura NEJM 1985

**MS: 2,5%  
soit 0.4%/an**



**PVM  
➔ Risque ACV  
/ arythmie  
ventriculaire**



Düren JACC 1988

FE VG  
cl. NYHA  
FA

**IM sévère  
MS: 1,8%/an**

Grigioni, JACC 1999

# Evolution et Suivi des PVM chez le sportif ?

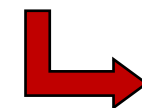
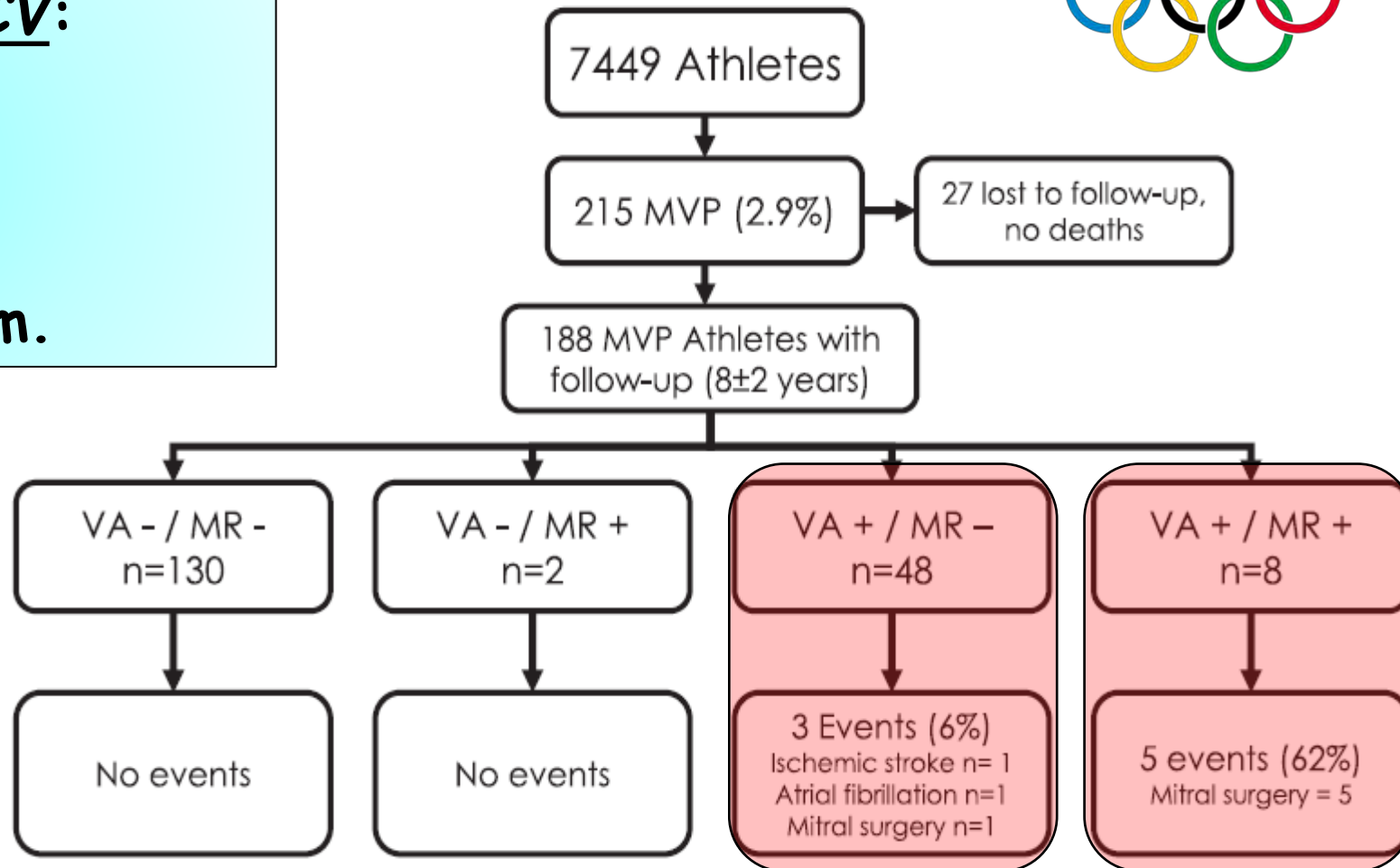
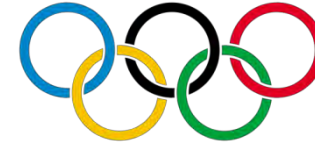
## Evaluation CV:

Ex Clin + ECG

Ep. Effort

ETT

⇒ Olympic program.



# Prolapsus valvulaire mitral et Sport en 2018

## Review: Mitral prolapse: An old mysterious entity: Role of MM imaging sport eligibility

Maron TF 4  
JACC 2005

Pelliccia ESC.  
EHJ 2005

Cardiological committee  
sport eligibility 5<sup>e</sup> ed. 2017

Recommendations: No eligibility

### AHA/ACC

Prior syncope;  
Sustained or repetitive and non-sustained supraventricular tachycardia or frequent or complex ventricular tachyarrhythmias on ambulatory Holter monitoring;  
Severe MR;  
LV systolic dysfunction (EF <50%)  
Prior embolic event;  
Family history of MVP-related sudden death

### Tous sports autorisés sauf si:

- Syncopes (arythmogène?)
- ATCD familiaux de MS
- Arythmies complexes SVr et Vr
- IM importante
- QT long / T<0 inf-lat

and syncope;  
History of juvenile sudden death;  
Brugada syndrome;  
Moderate to severe MR;  
Supraventricular tachyarrhythmias or ventricular arrhythmias at rest during exercise and/or with right bundle branch block morphology;  
ST-segment depression or ST-segment waves in inferior or lateral precordial leads.

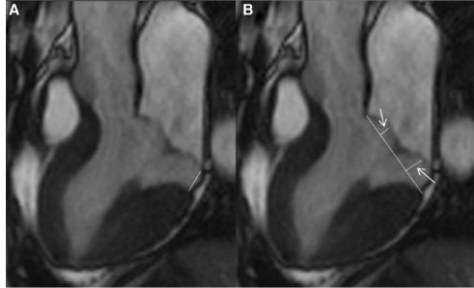
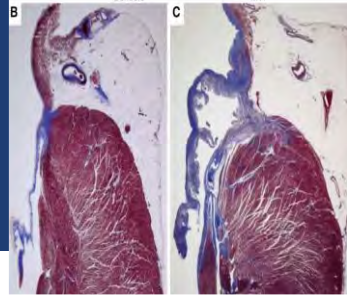
### ATHLETES WITH MVP: FOLLOW UP/ELIGIBILITY

Athletes with MR should be evaluated to determine whether sports participation can continue. Exercise testing is recommended to confirm asymptomatic status in athletes with MR (Class I; Level of Evidence B)

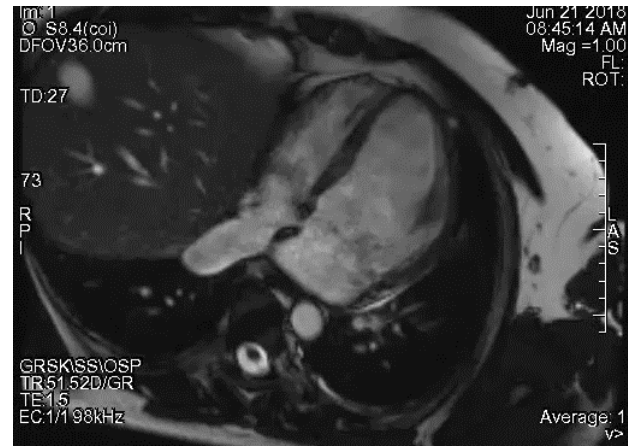
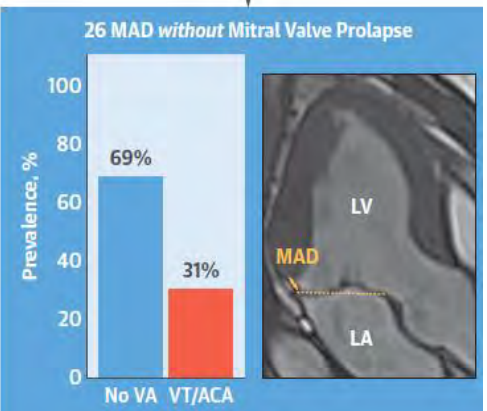
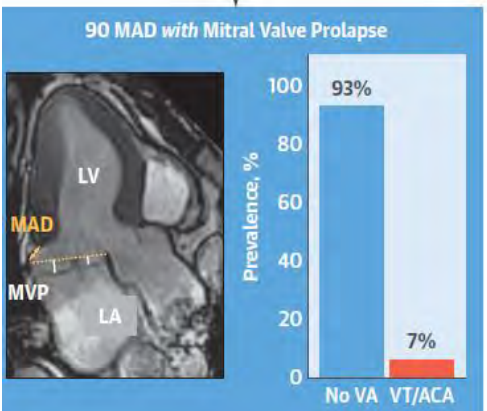
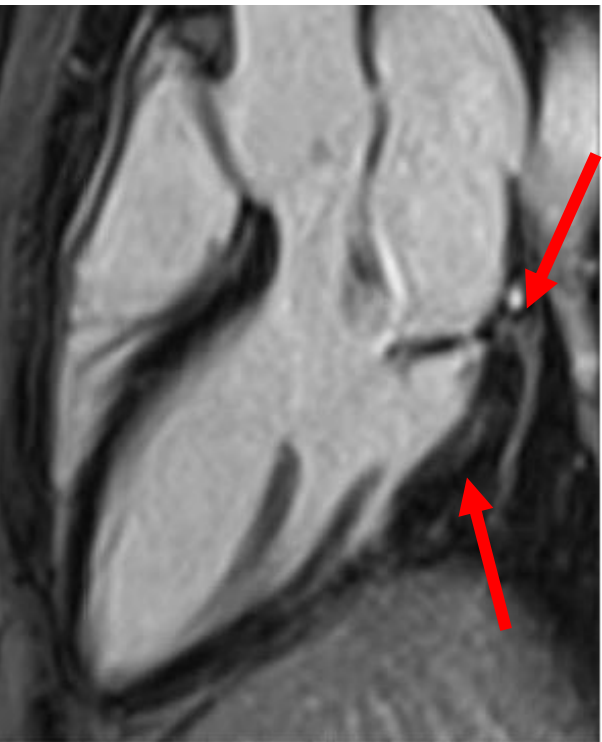
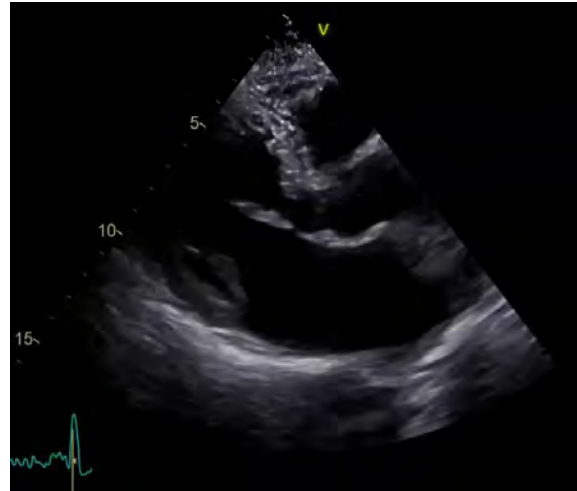
Bilan et suivi (6 à 12 mois)  
**Echocardiographie + Test Effort**  
**± Holter ECG**

eligibility period for competitive sports in athletes of Groups A and B (horse shoe mitral prolapse) may be considered in athletes with redundant or myxomatous mitral valve leaflets for the other groups.

# PVM, IM, Disjonction de l'Anneau Mitral et Fibrose



**Fibrose des M. inférobasal et papillaire**  
*Processus de cicatrisation / étirement mécanique*  
*/ mobilité excessive de l'appareil valvulaire*  
*/ disjonction valvulaire mitrale*  
**+ enroulement systolique postérieur**

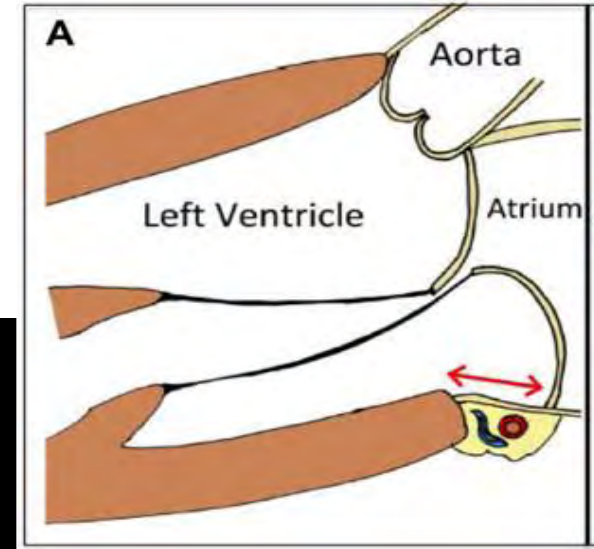
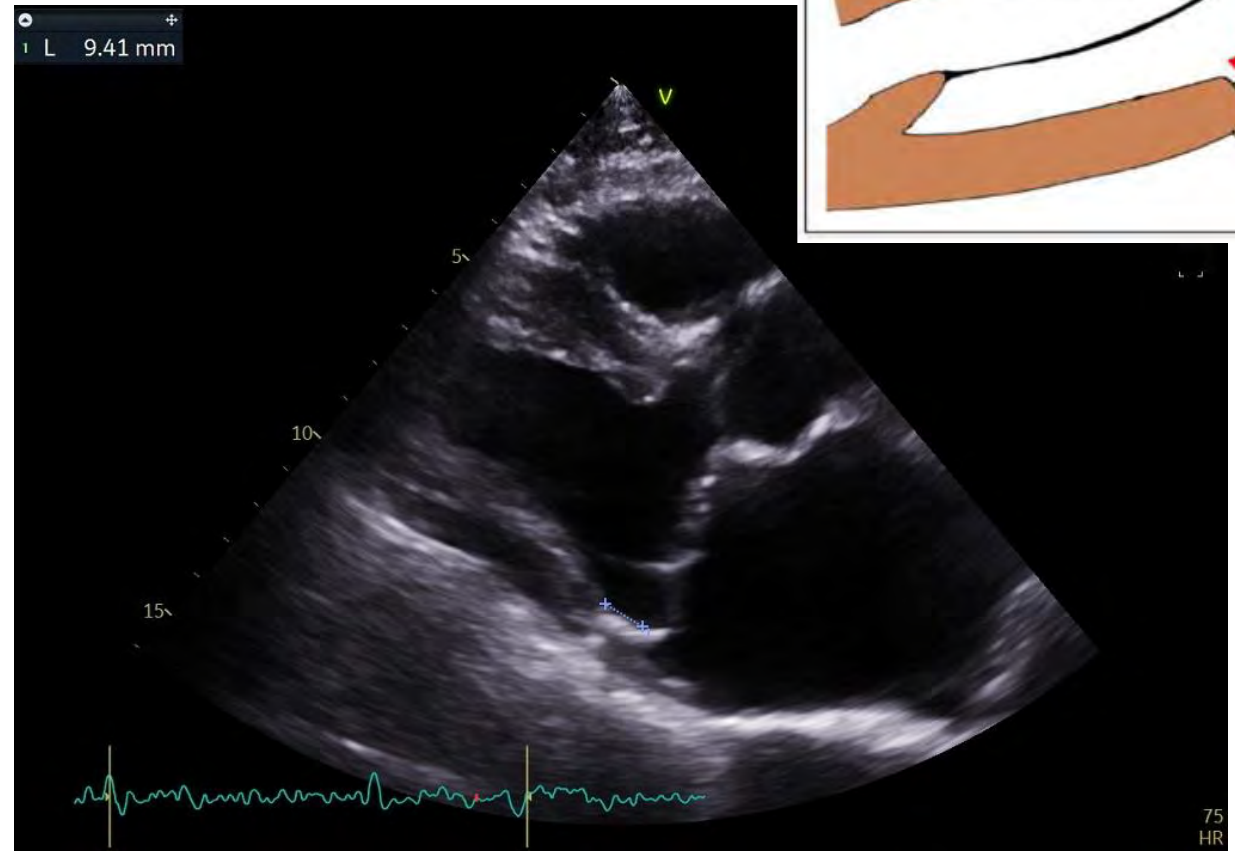
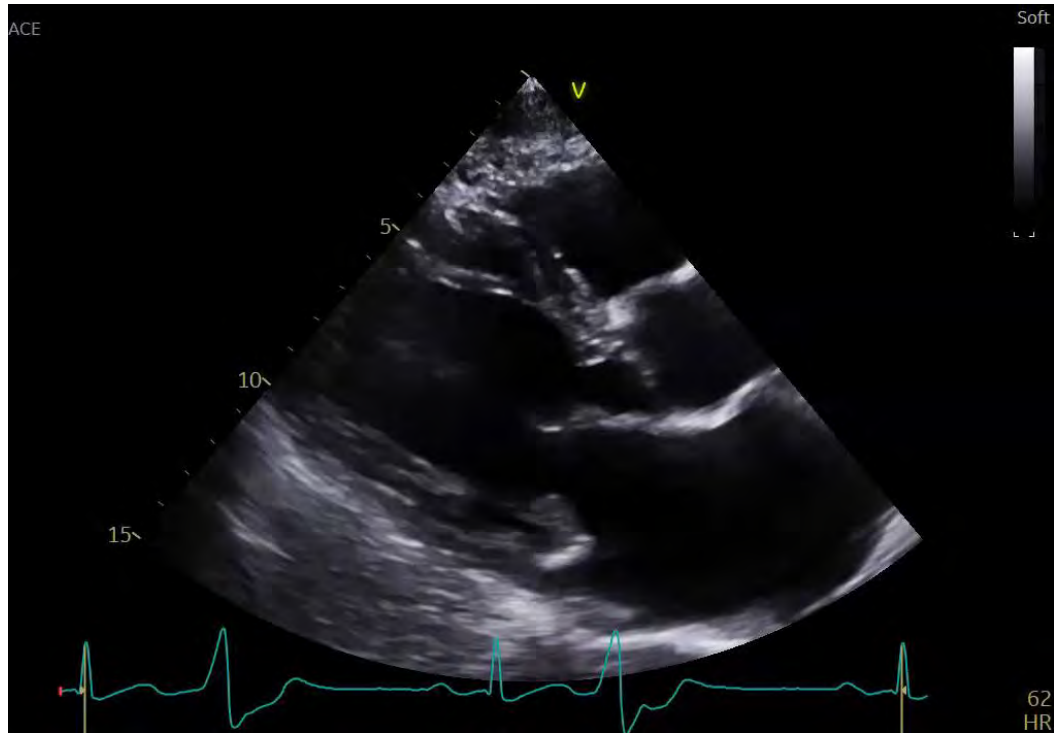


Perazzolo et al. *Circ CV Im.* 2016;9

Dejgaard et al  
*JACC* 2018; 2(14)

# Mr SY, homme, 62 ans, golfeur, handicap 20

## Palpitations suggérant des extrasystoles



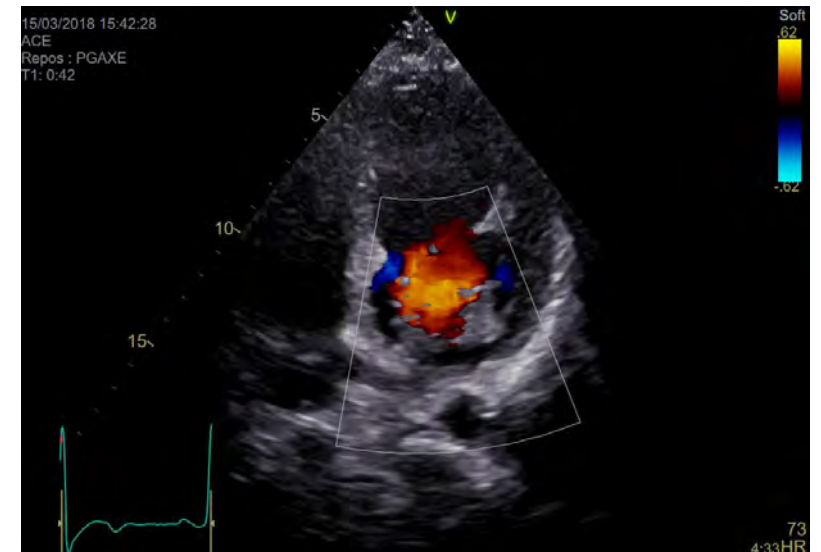


# PVM et Risque Cardio-Vasculaire

	PVM MS (n=42)	PVM Controle (n=84)	<i>P</i>
Femme	28	56	1
Age	53.36±14.4 44 at SD	53.88±14.2	0.85
FE VG	62.2±5.2	62.2±5.0	0.98
IM			1
- Absence ou minime	8	16	
- Modérée/moyenne	29	58	
- Moyenne/sévère	3	6	
- Sévère	2	4	
FA	7	15	1

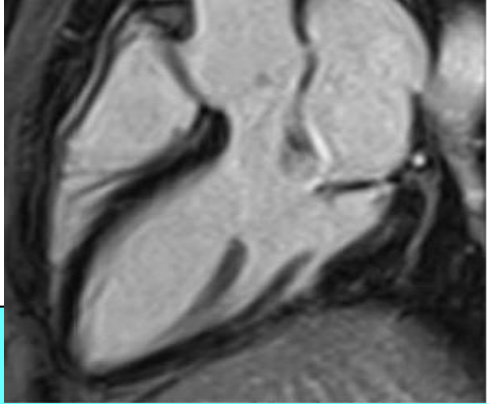
**MS ds le groupe  
à « faible risque »**

*Hourdain et Al.  
Circulation, 2018*

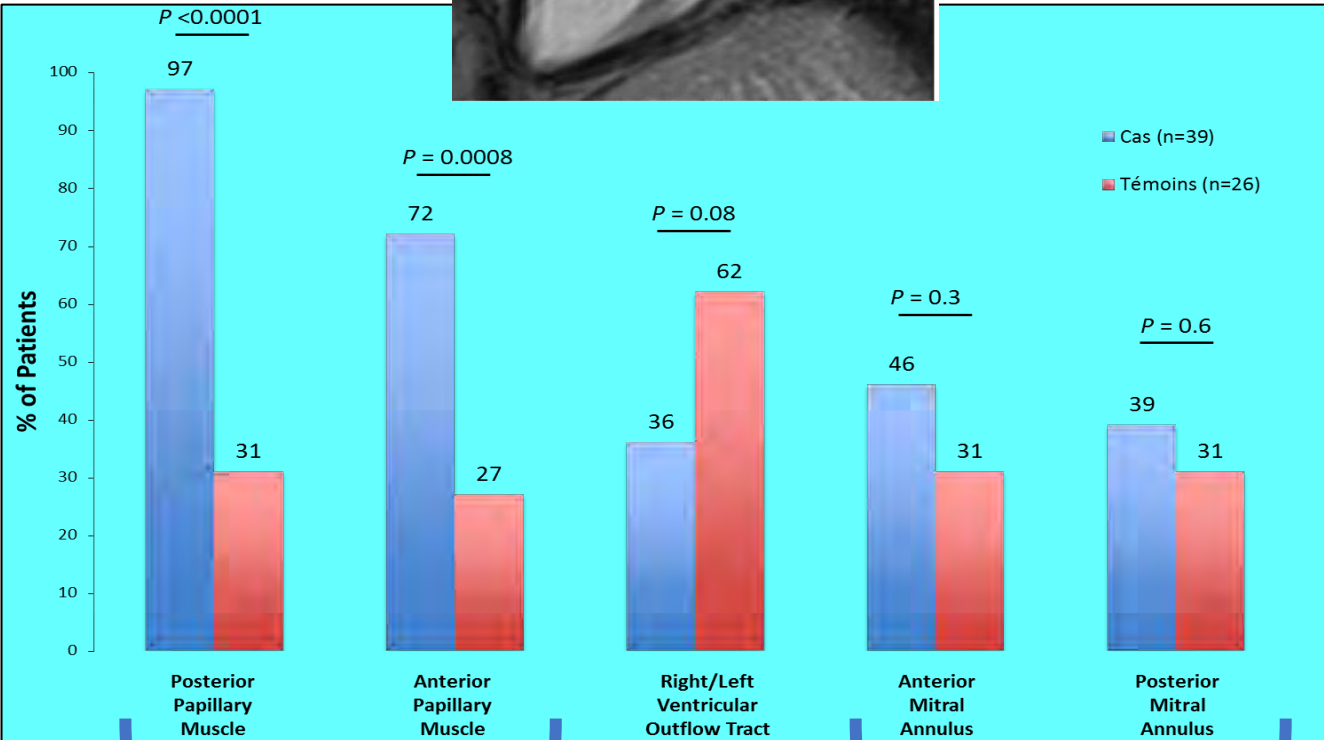




# PVM et Risque Cardio-Vasculaire

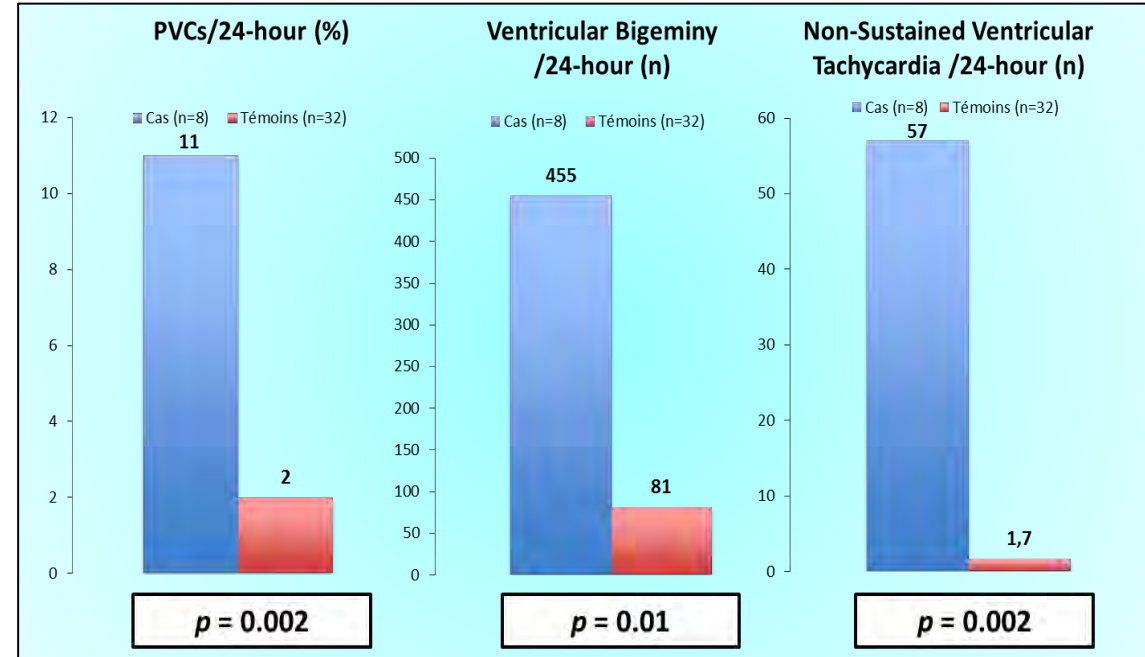


■ Cas (n=39)  
 ■ Témoins (n=26)



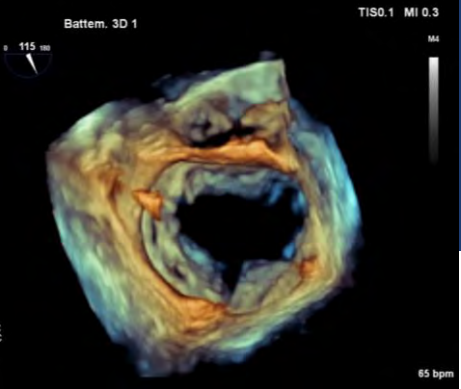
Muscle papillaire

Anneau mitral

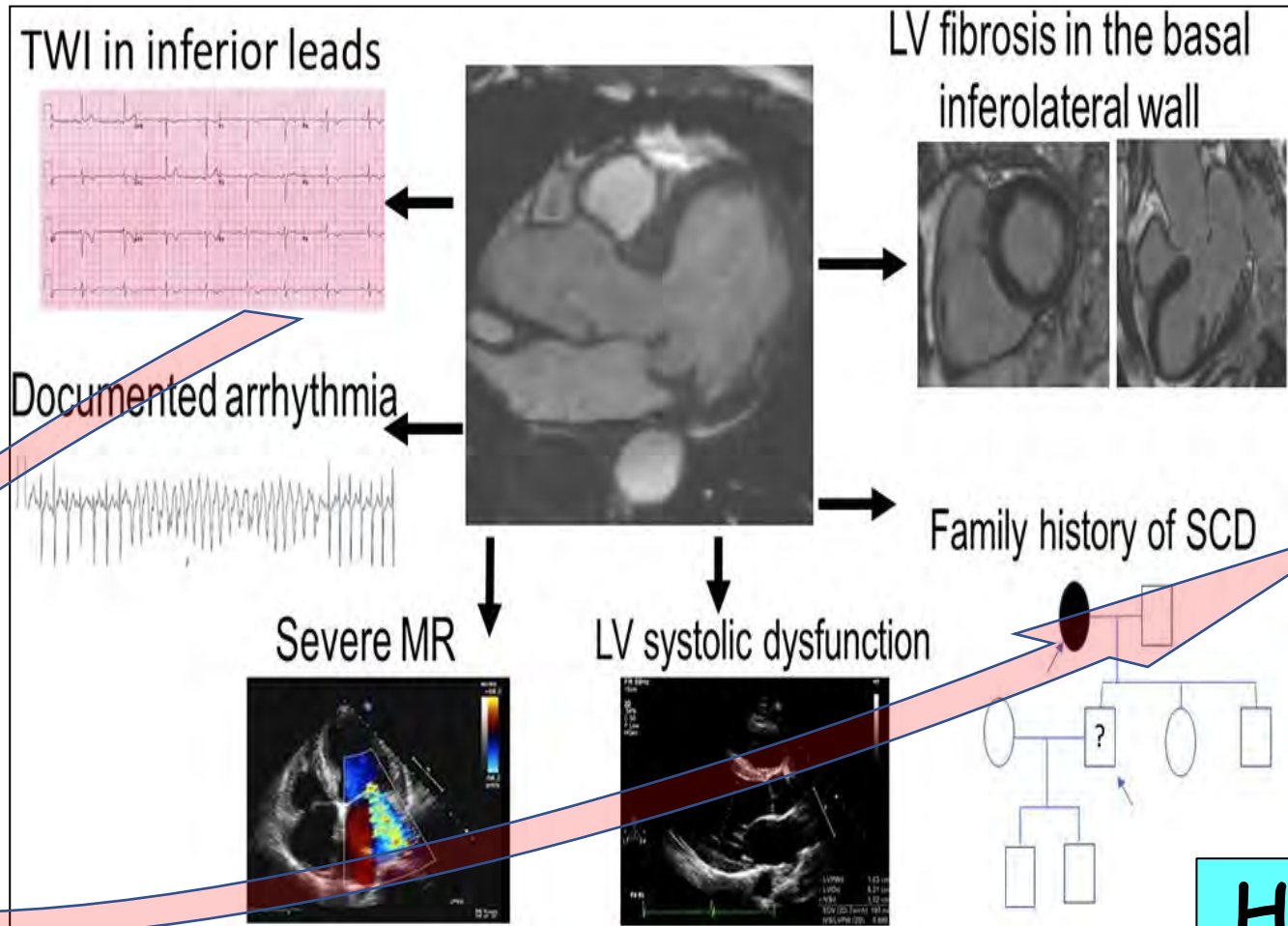


Hourdain,  
 Circulation 2018

# PVM: marqueurs spécifiques de risque de MS ?



**ECG**

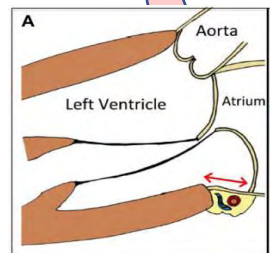


**In low risk**  
Follow-up  
(6-12 m)  
TTE + ET  
± Holter

**Decision ?**

**IRM**

**Stress test**  
**Holter**  
sport situation

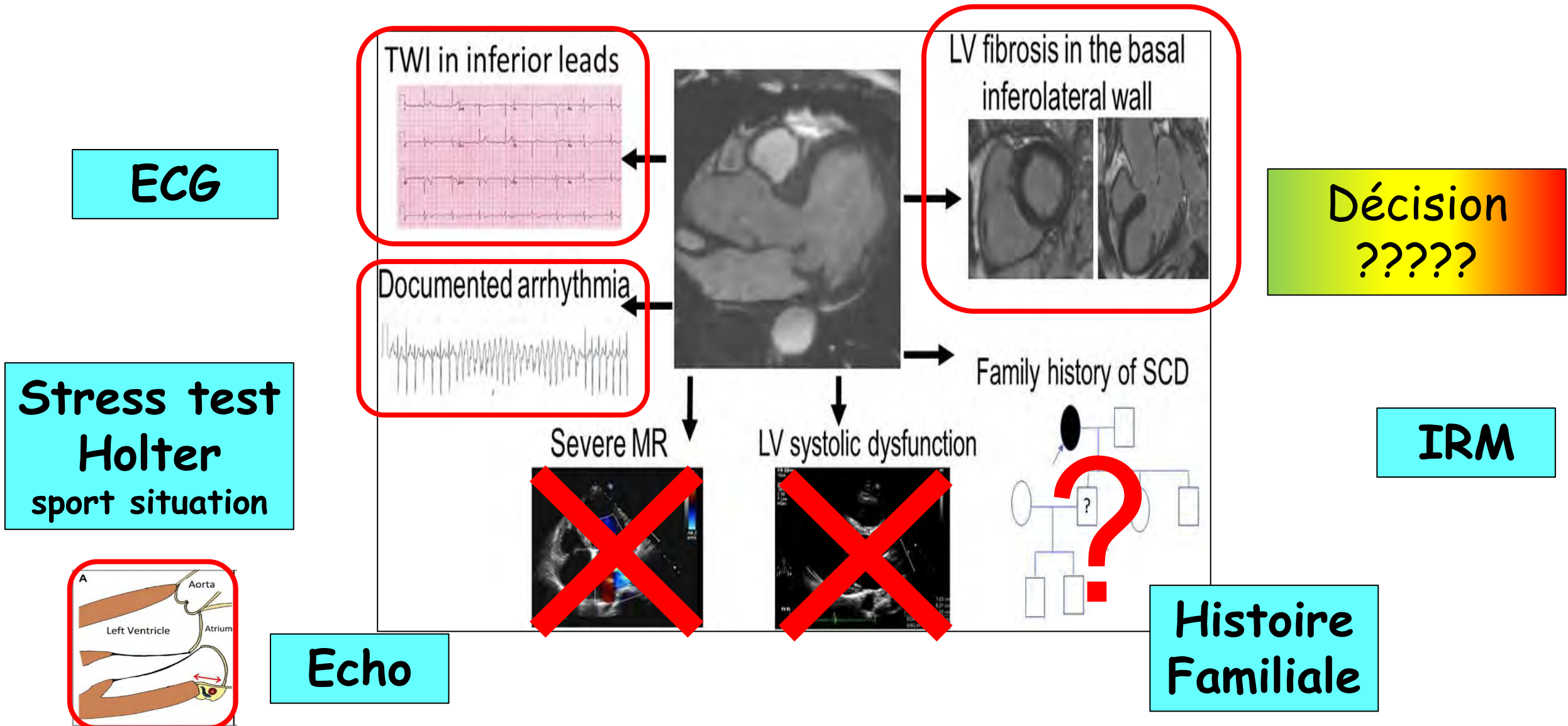


**Echo**

**Histoire  
Familiale**

Gati S, Malhotra A, Sharma S. Heart 2019;105:106-111.

# Et le risque de MS de notre sportive ?



# Quelle conduite à tenir vis-à-vis du sport ?

- Abstention thérapeutique et suivi ?

- Contre-indication à l'activité sportive ?  
Mais l'impact sur l'évolution n'est pas connu

- Si traitement, lequel ?

➤ Pharmacologique

- Bêtabloquant
- Propafénone / Flécaïnide
- Amiodarone

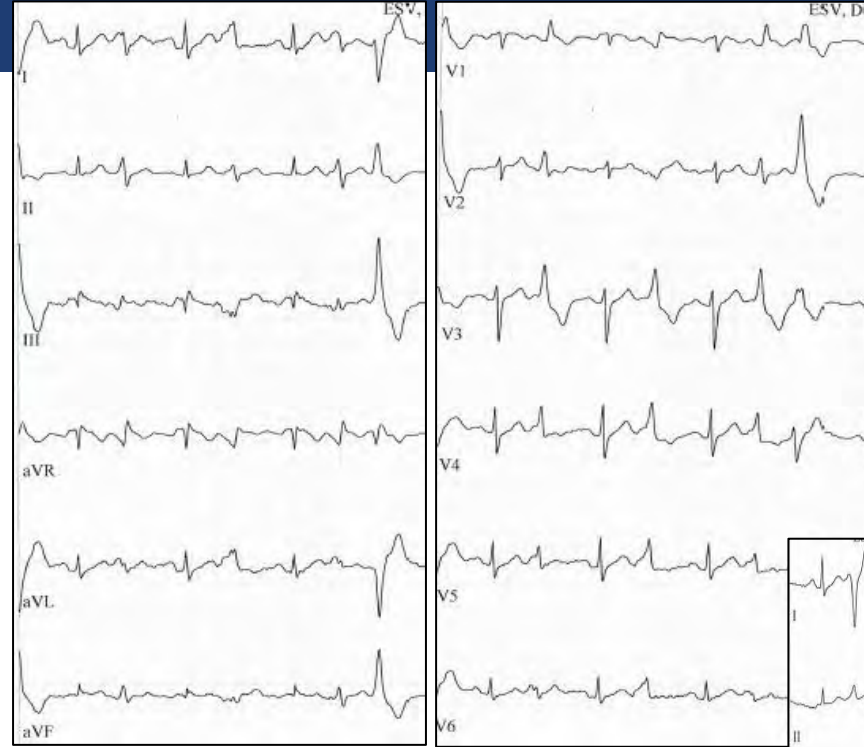
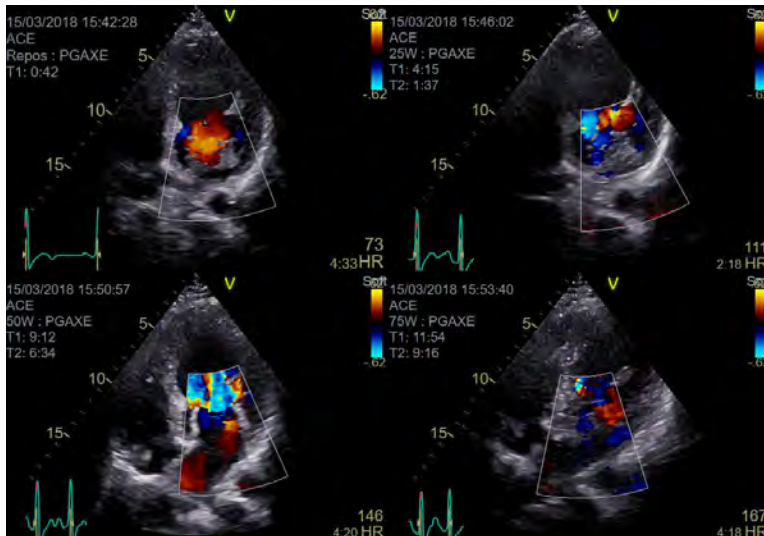
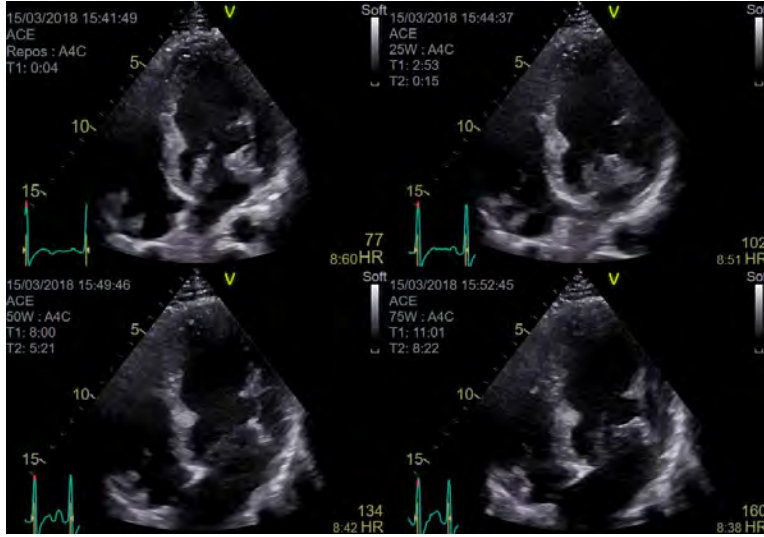
➤ Correction chirurgicale du prolapsus et de la disjonction ?

➤ Ablation

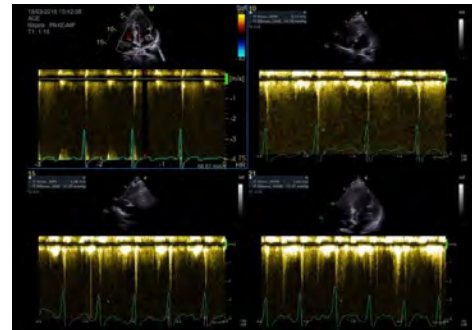


# PVM: place de l'écho d'effort

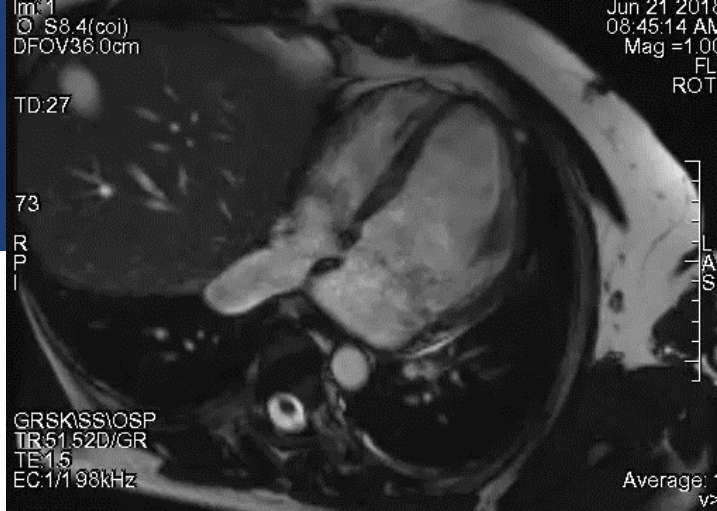
Homme, 44 ans  
Triathlète avec  
PVM et IM



**P max = 225 W**  
**HF max = 167 bpm**

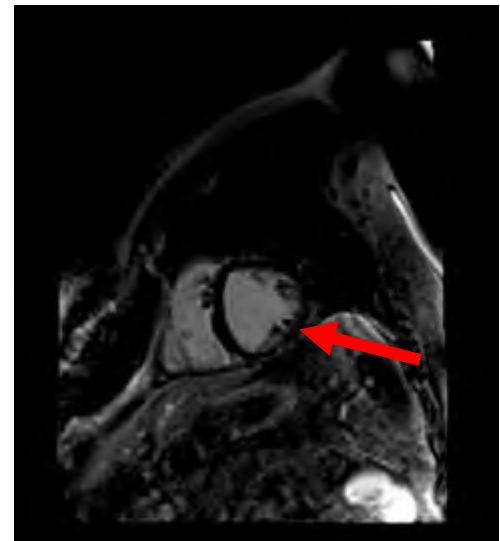
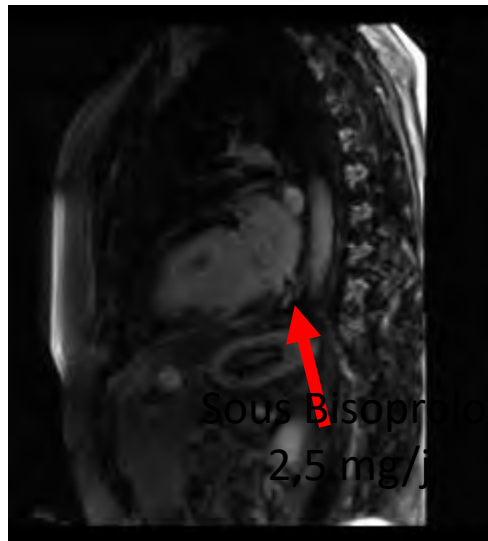
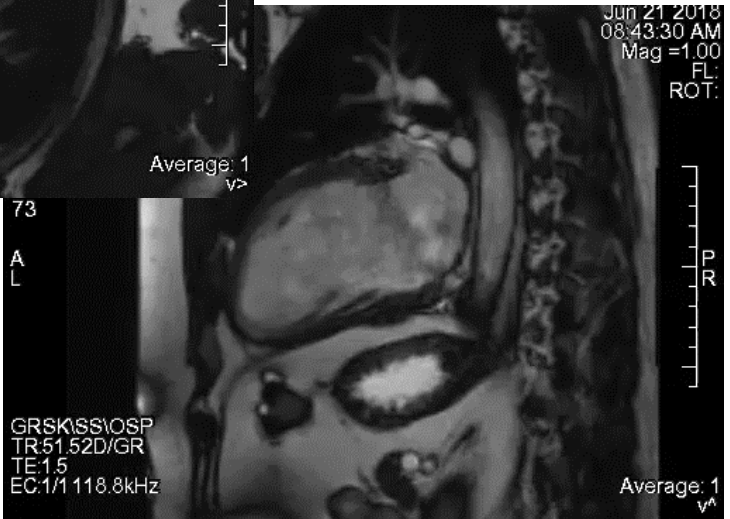


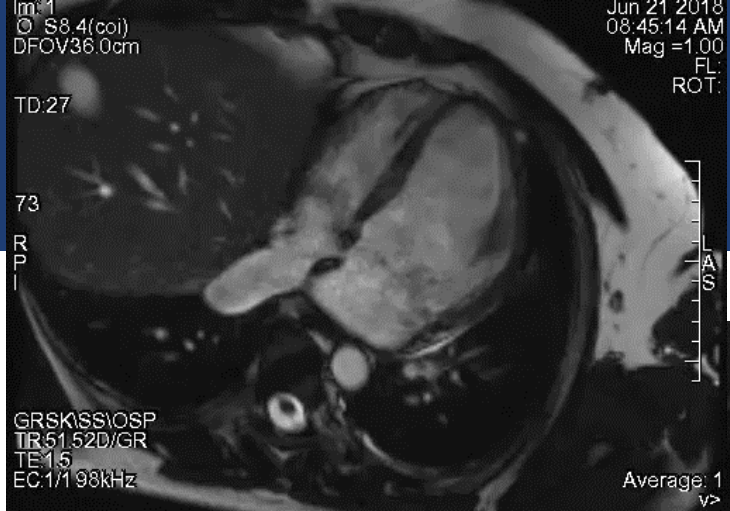
**TI max = 37 mmHg**



Jun 21 2018  
08:45:14 AM  
Mag =1.00  
FL:  
ROT:

# IRM

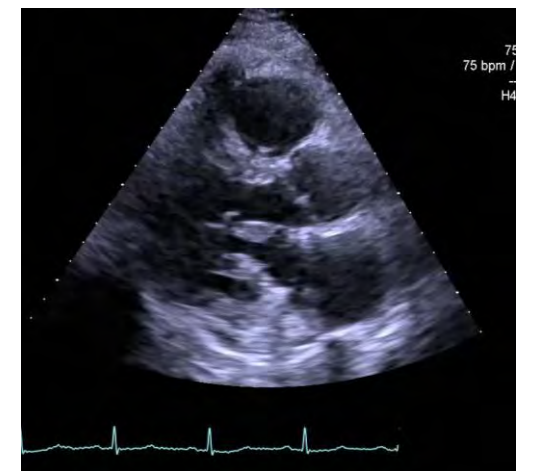
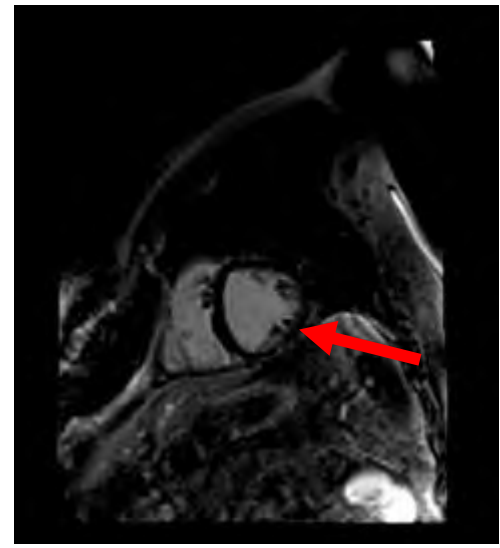
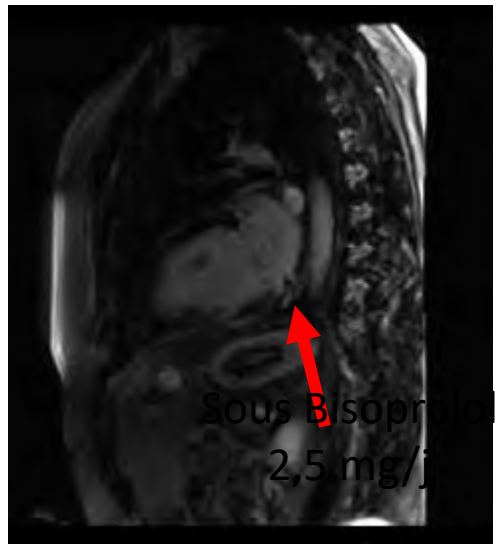
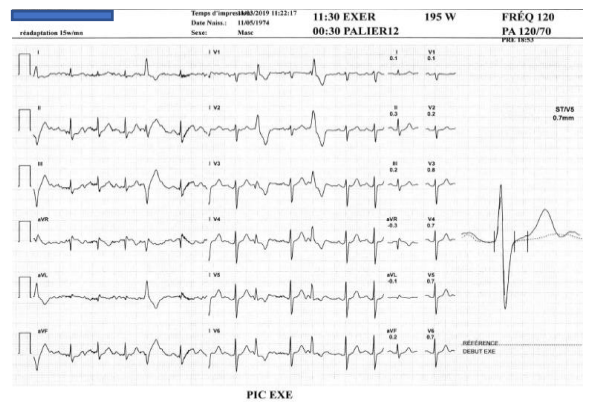
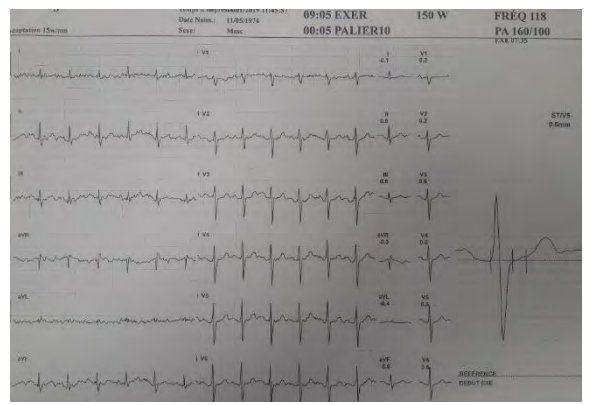
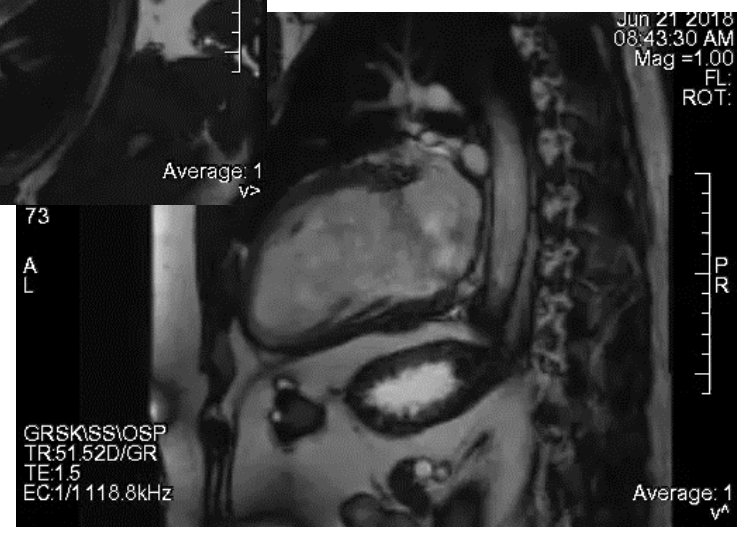




IRM



Décision d'intervention avec plastie mitrale





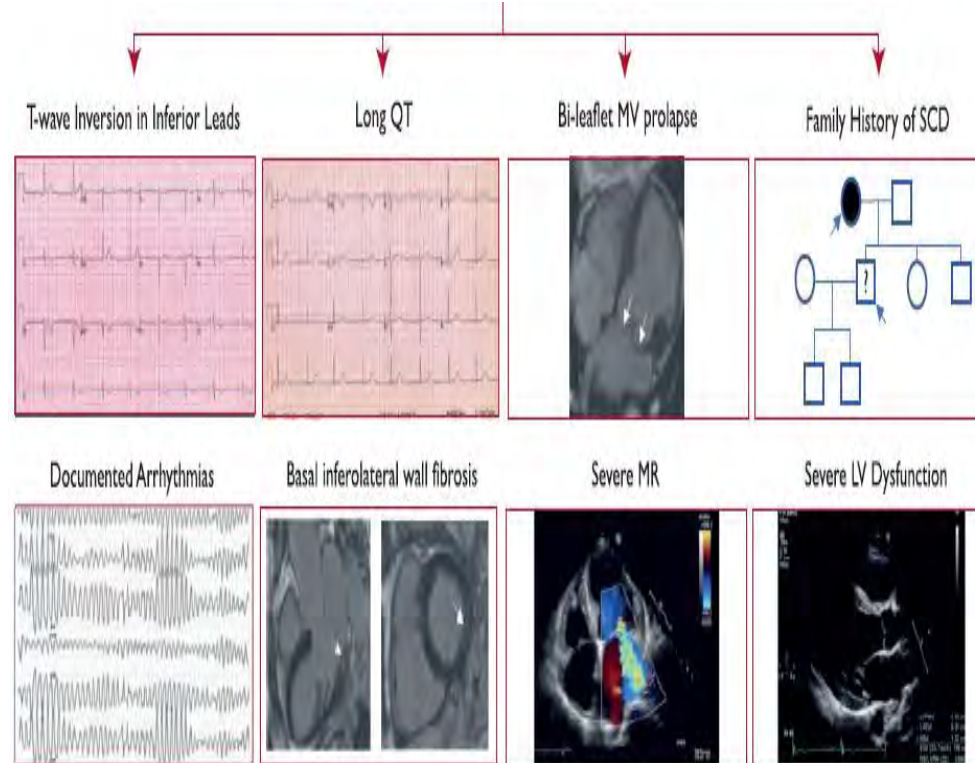
MS = 0,2 à 0,4 % des patients avec PVM

surement sous-estimé

prévalence ≈ 2 à 3% ds population

**2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death****PVM « malin »**

- Jeunes adultes (svt des femmes)
- ↗ QTc
- T<0 en inf
- ESV fréquentes ou TV (Holter et tests d'effort)



Gati et al Heart 2019

- DAM
- Prolapsus des 2 feuillets
- FE VG réduite
- Fibrose / IRM

Impact du Sport ???

*Souvent au cas / cas en accord avec les reco<sup>o</sup> sans être trop restrictif*