APSC TAIPEI 2026

30th edition

APSC TAIPEI 2026

30TH ASIAN PACIFIC SOCIETY OF CARDIOLOGY CONGRESS

14–17 May 2026 | Taipei

Taipei International Convention Center

MEDIC

CMR IN THE DIAGNOSIS AND PROGNOSTICATION OF MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES (MINOCA)

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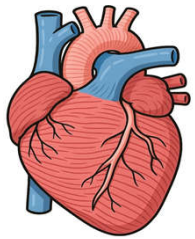
Medic Medical Center, Vietnam



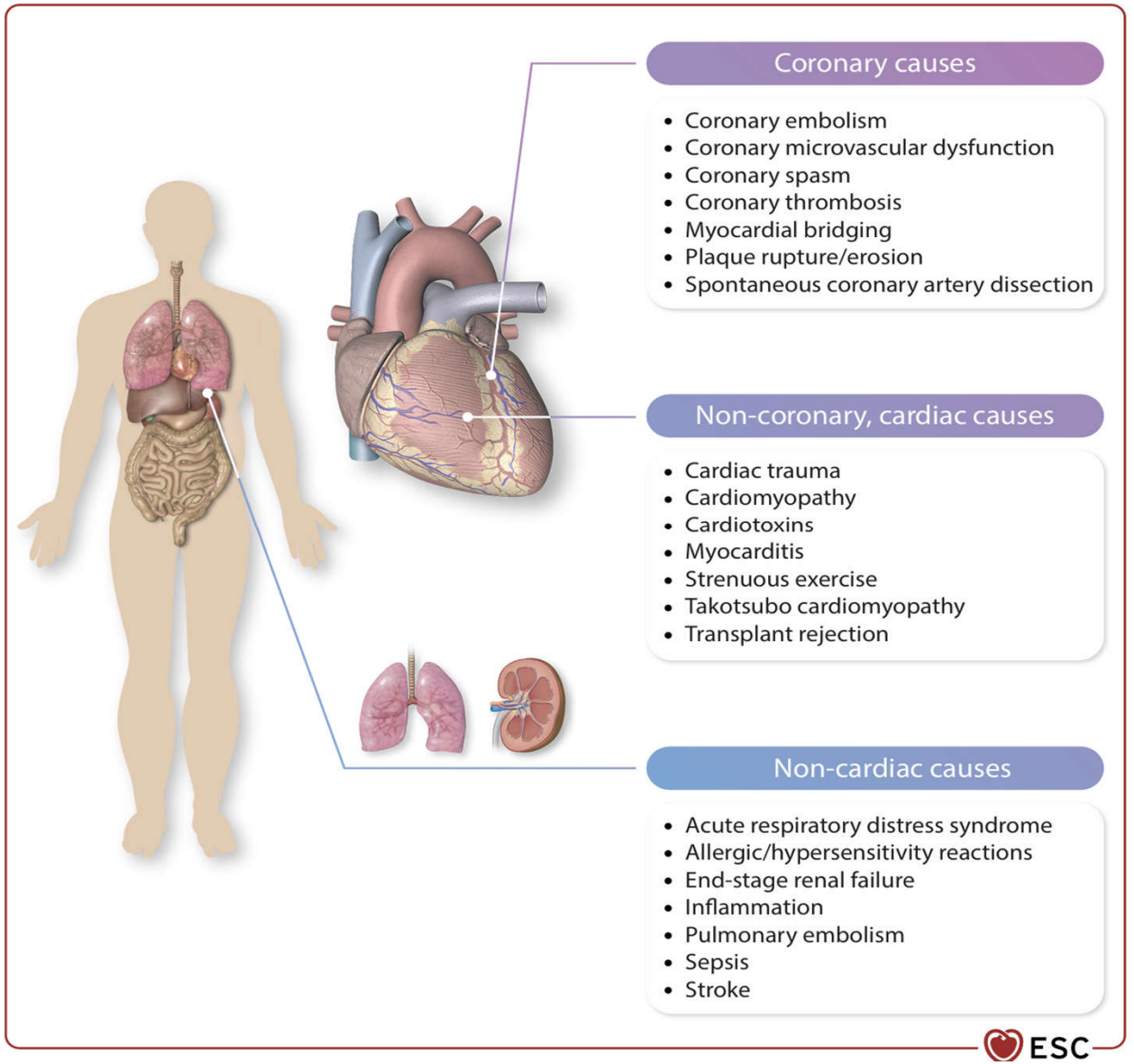
Background:

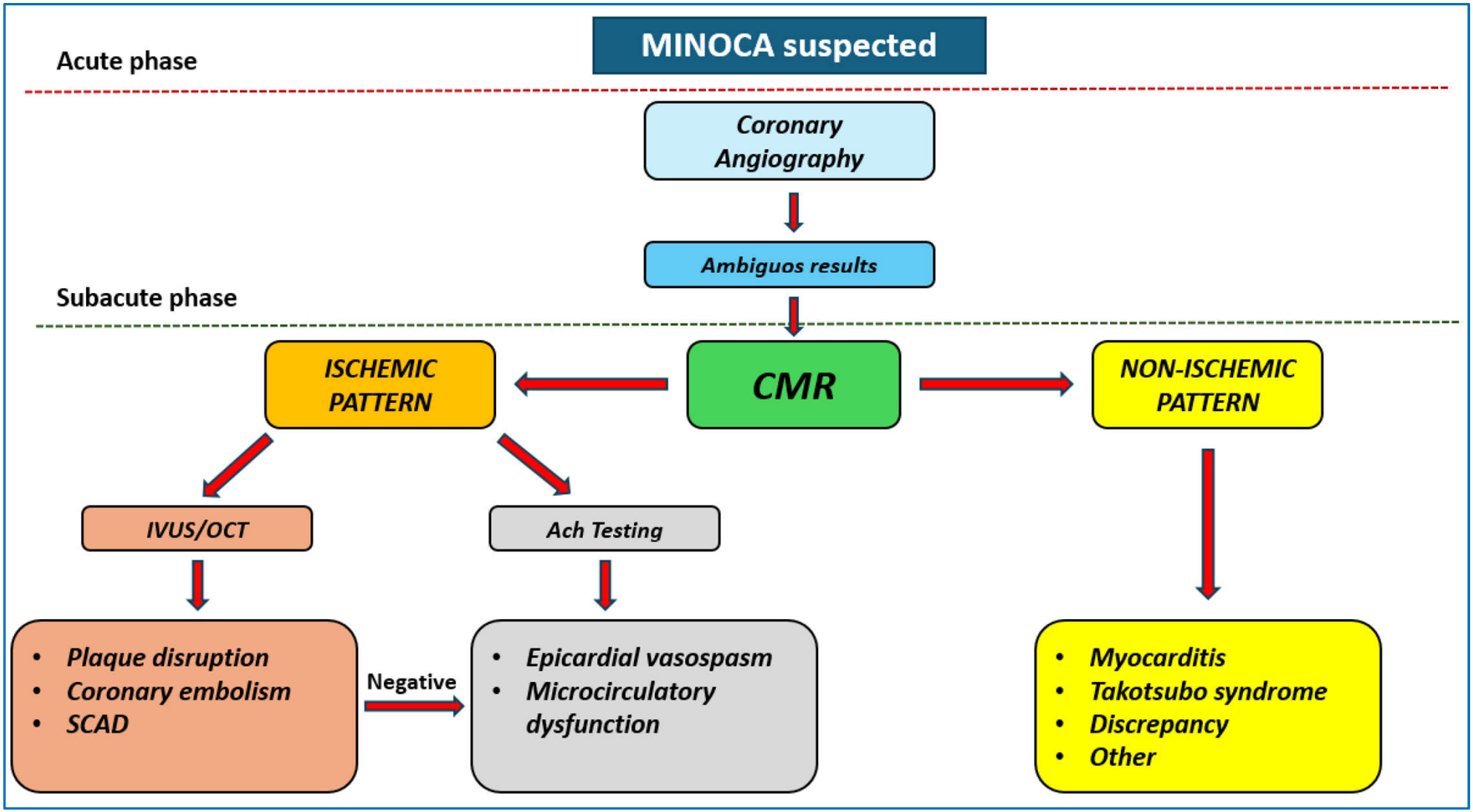
- MINOCA = Myocardial Infarction with Non-Obstructive Coronary Arteries.
- MINOCA is classified under the group of Acute Coronary Syndromes (ACS).
- Accounts for 1–14% of patients with acute coronary syndrome.
- The underlying causes may be coronary or non-coronary, originating from cardiac or extracardiac conditions.

2023 ESC Guidelines for the management of acute coronary syndromes

Cause / MINOCA

2023 ESC Guidelines for the management of acute coronary syndromes

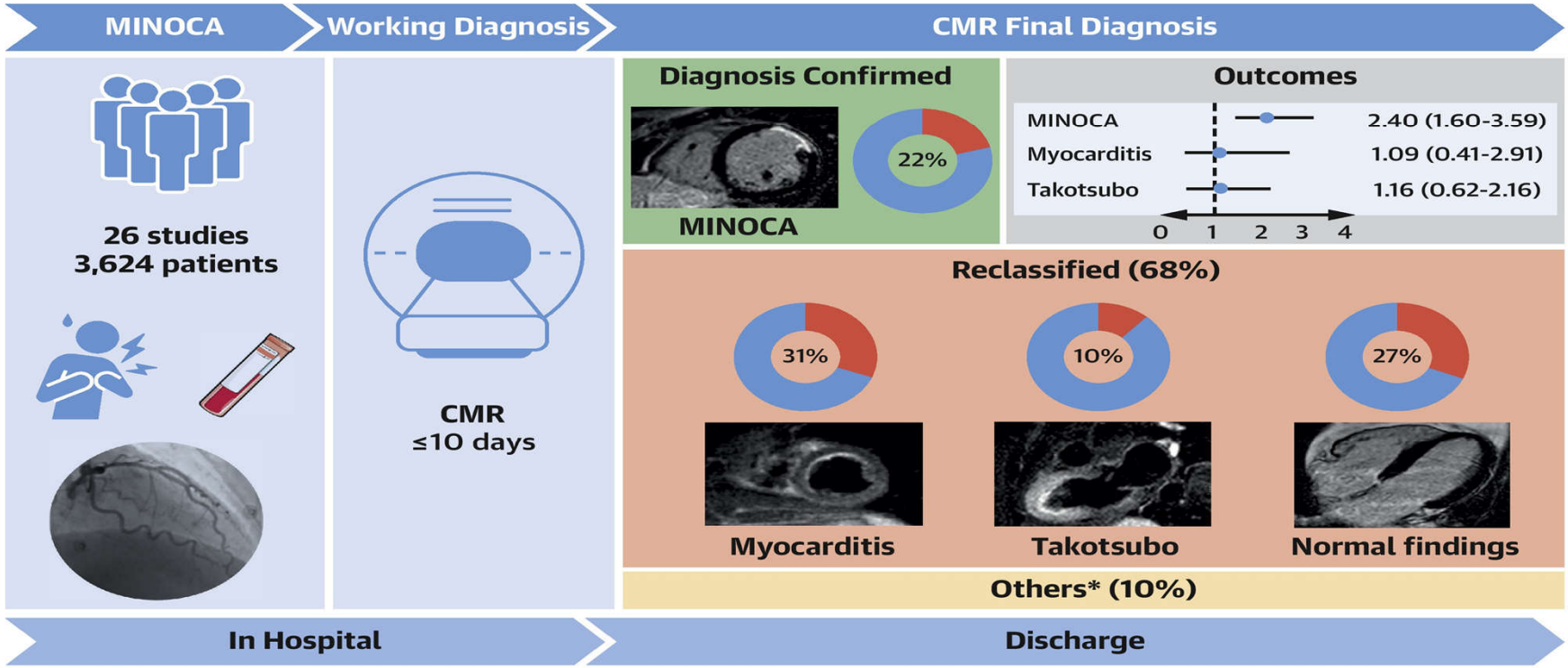




*ESC/AHA guidelines. *MINOCA from A to Z*. American College of Cardiology (ACC), 2022*

CMR / MINOCA

CENTRAL ILLUSTRATION: Summary of the Main Findings, Proving the Diagnostic and Prognostic Value of Cardiac Magnetic Resonance in the Management of Patients With Myocardial Infarction With Nonobstructive Coronary Arteries



Mileva N, et al. J Am Coll Cardiol Img. 2023;16(3):376–389.

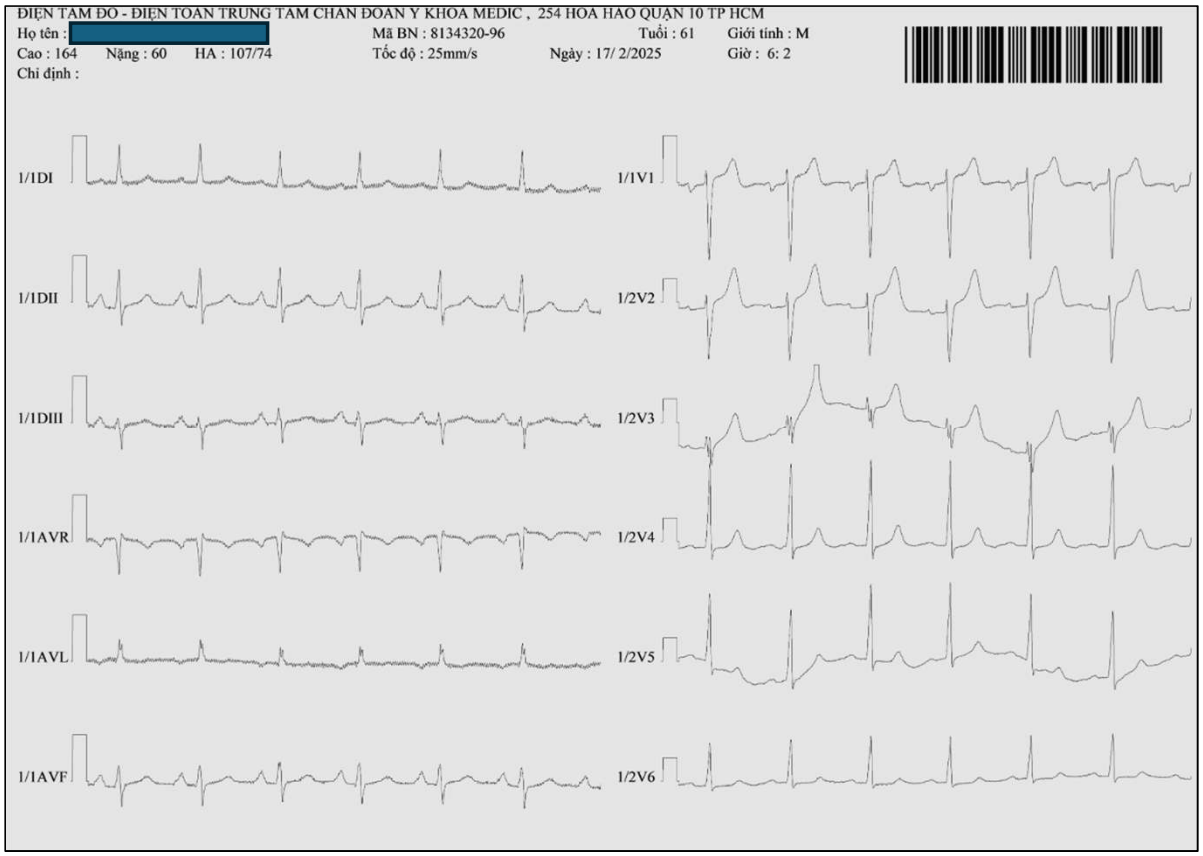
Medic Medical Center, Ho Chi Minh City

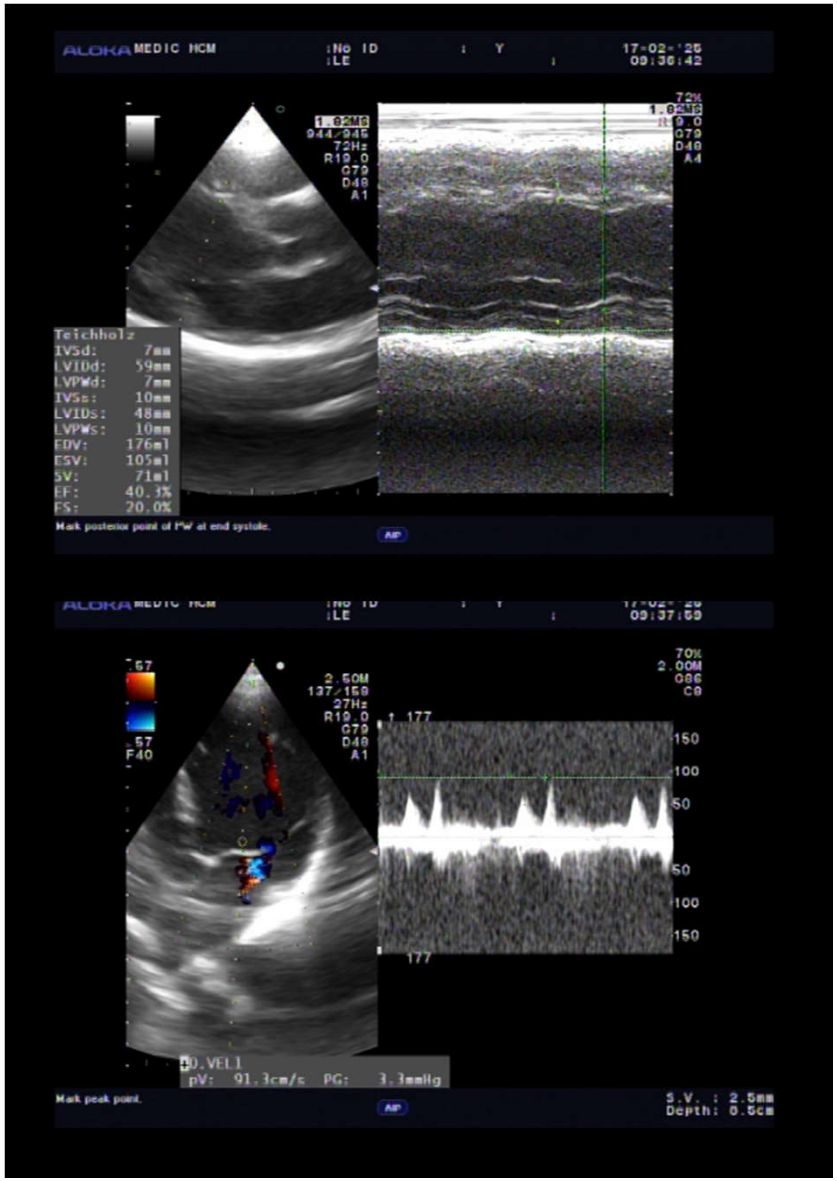
- From 01/01/2025 to 28/12/2025.
- 1,015 patients underwent CMR using a GE Explorer 1.5T.
- 104 patients were diagnosed with MINOCA.
- Coronary-related myocardial injury was 22.
- Myocarditis was 65 patients.
- Takotsubo was detected in 5 patients.
- Hypertrophic cardiomyopathy was 9 patients.

Case 1

- 61M, Soc Trang, 17/02/2025.
- Chief complaint: Angina pectoris.
- Present illness history: 2 weeks prior to admission, sudden angina pectoris, squeezing sensation, non-radiating but sweating, the pain lasted for 5 hours without relief, no fever, no sore throat, no diarrhea.
- Past medical history: No cardiovascular disease, smoker.

Echocardiography and ECG





Troponin I hs (+); DSA Coronary Arteries (-)

CÔNG TY TNHH Y TẾ HÒA HẢO
PHÒNG KHÁM ĐA KHOA
KHOA XÉT NGHIỆM (MEDIC - LAB)
Hotline: (028) 3834 9593 - 1900 6497
254 Hòa Hảo - P.4 - Q.10 - TP.HCM
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PID: **8134320** S.T.T.: **123557**
Ngày giờ đăng ký: **06:55:52 17/02/2025**
Ngày giờ lấy mẫu: **07:00:00 17/02/2025**
Ngày giờ nhận mẫu: **07:03:00 17/02/2025**

PHIẾU KẾT QUẢ XÉT NGHIỆM

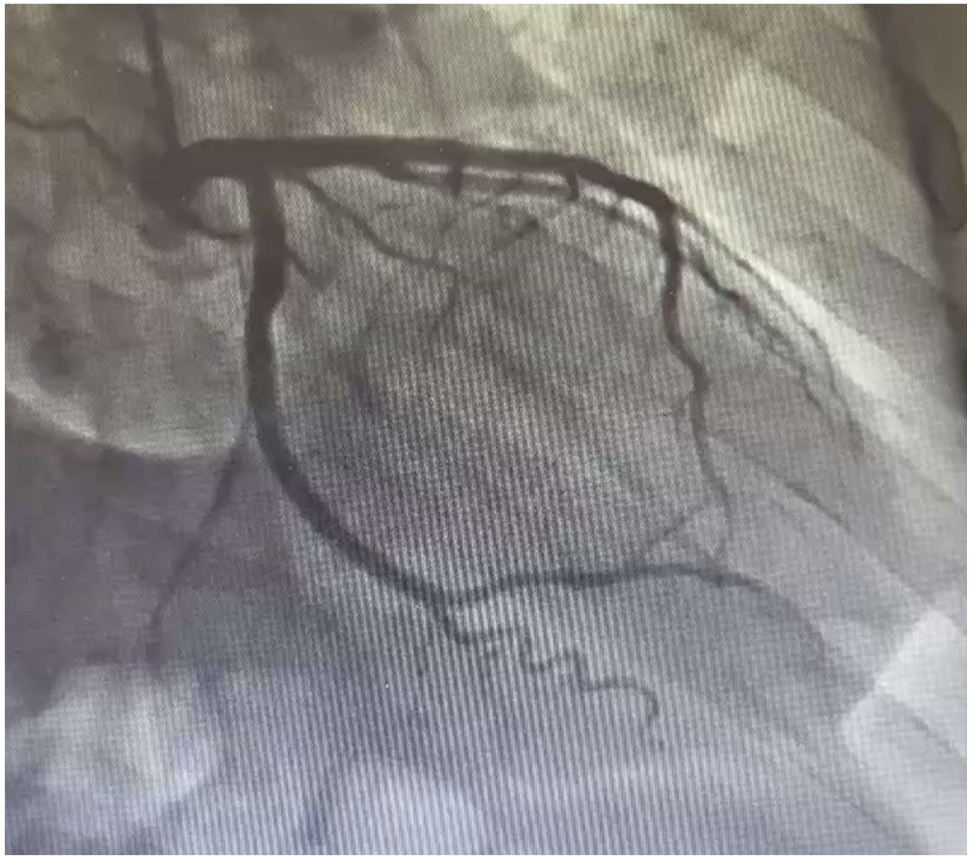
(BM.TTXN.XN.02.1 - Ngày áp dụng: 01/03/2016 - Phiên bản: 1.2)

Họ tên: [redacted]
Ngày tháng năm sinh: **1964**
Phái: **Nam**
Số CCCD/Hộ chiếu:
Quốc tịch:
ĐT: **0943791032**
Địa chỉ: **ẤP PHÚ THUẬN, X. THẠNH PHÚ, H. MỸ XUYÊN, T. SÓC TRĂNG**
Đơn vị: ***Medic***
Nơi lấy mẫu: **Lầu 2**
BS yêu cầu: PGS. TS. BS NGUYỄN TUẤN VŨ
Loại mẫu: **Máu/N.Tiểu**
Tình trạng mẫu: **Đạt**

TÊN XÉT NGHIỆM	KẾT QUẢ	KHOẢNG THAM CHIẾU	MÃ QT
Glucose (mmol/L) (FPG)[1]	***6.26 H***	(3.90 - 5.60 mmol/L)	*QTSH001*
Glucose (mg/dL)	***112.7 H***	(70.2 - 100.8 mg/dL)	
IONOGRAMME[2]:	*		*QTSH067*
Na	**137.3**	(130 - 145 mmol/L)	
K	**4.11**	(3.40 - 5.1 mmol/L)	
Ca	**2.32**	(2.1 - 2.80 mmol/L)	
Cl	**102.3**	(96 - 108 mmol/L)	
Urea/ Serum[1]	**35.40**	(15 - 49 mg/dL)	*QTSH002*
*Độ Lọc Cầu Thận (CKD-EPI)	*		
Creatinin/Serum[2]	**1.06**	(M: 0.6 - 1.3; F:0.5 - 1.1 mg/dL)	*QTSH027*
eGFR (CKD-EPI)	**80**	(≥ 90 mL/min/1.73 m²)	
LDL Cholesterol[2]	**2.48**	(<2.59; Ngưỡng: 2.59-4.13 mmol/L)	*QTSH093*
	.	(Cao: 4.14 - 4.91; Rất cao ≥ 4.92)	
HDL Cholesterol[2]	**1.13**	(≥1.55; Ngưỡng: 1.04-1.54 mmol/L)	*QTSH084*
	.	(Thấp: < 1.04)	
Triglycerides[1]	**0.841**	(<1.70; Ngưỡng: 1.70-2.25 mmol/L)	*QTSH015*
	.	(Cao: 2.26 - 5.64; Rất cao ≥ 5.65)	
Cholesterol, Total[1]	**4.20**	(<5.18; Ngưỡng: 5.18-6.21 mmol/L)	*QTSH003*
	.	(Cao: ≥ 6.22)	
GGT[1]	**38.79**	(M < 55 U/L; F < 36 U/L)	*QTSH004*
SGOT (AST)[1]	**26.31**	(< 35 U/L)	*QTSH005*
SGPT (ALT)[1]	**26.07**	(< 30 U/L)	*QTSH013*
IV. MIỄN DỊCH - IMMUNOLOGY			
TSH u.sensitive (3rd G)[1]	**1.48**	(0.32 -5 µIU/ml)	*QTMD009*
Free T4[2]	**1.00**	(0.71 - 1.85 ng/dL)	*QTMD036*
Troponin-I hs (Abbott)[1]	***275.4 *****	(M < 34.2 ng/L, F < 15.6 ng/L)	*QTMD011.1*

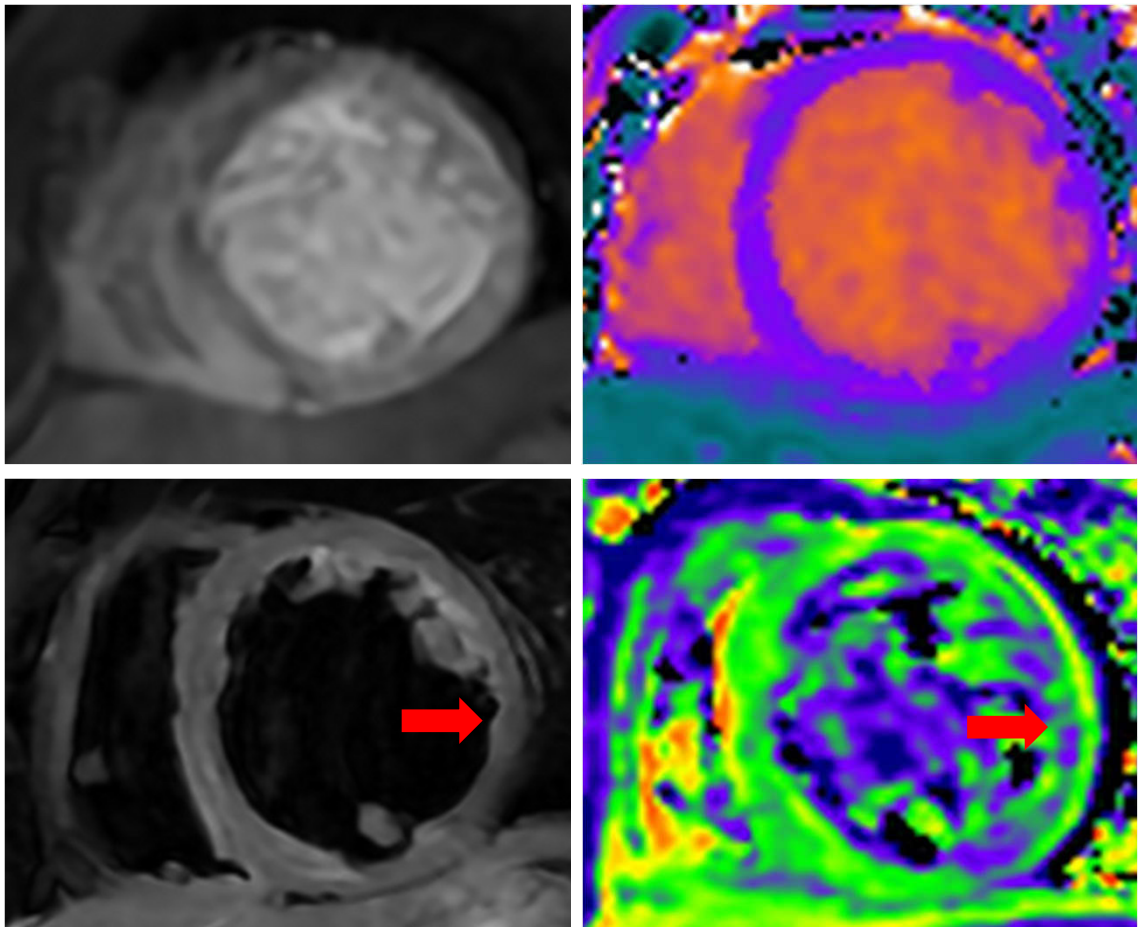
Thời gian duyệt: 07:46:38 17/02/2025 **In lần 1: 07:47:24 17/02/2025** Số trang: 3/4

* Đây là kết quả dạng số trả tự động từ hệ thống Medic. Bản giấy, khoa Xét nghiệm đã ký trả bệnh nhân

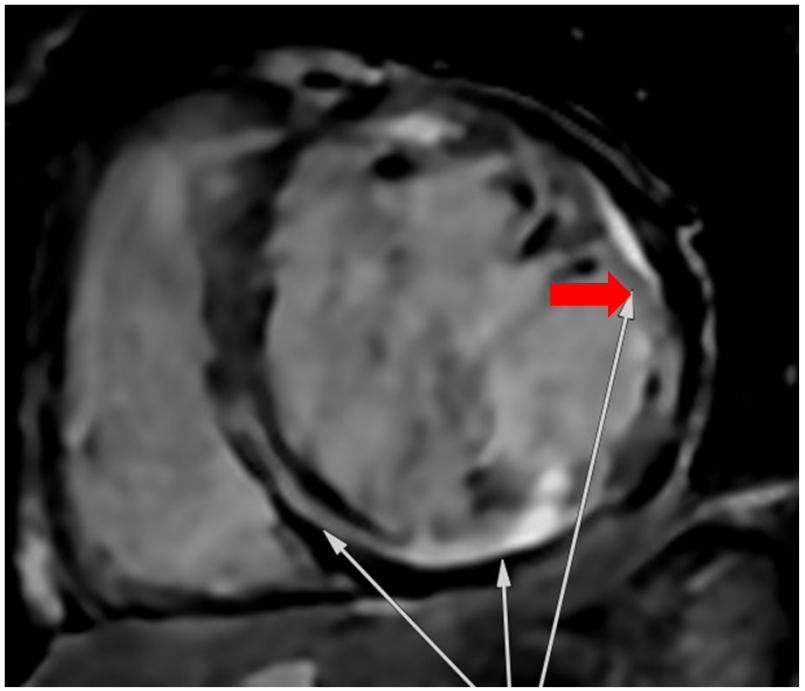


Unstable angina or acute ST-elevation myocardial infarction

CMR with contrast contrast agent



T1 mapping 1051ms; ECV=41%;
T2 mapping 60ms; No-reflow (+)



LVEF=31%; RVEF=58%; LGE mass=13 gram; LGE/LV mass=14%

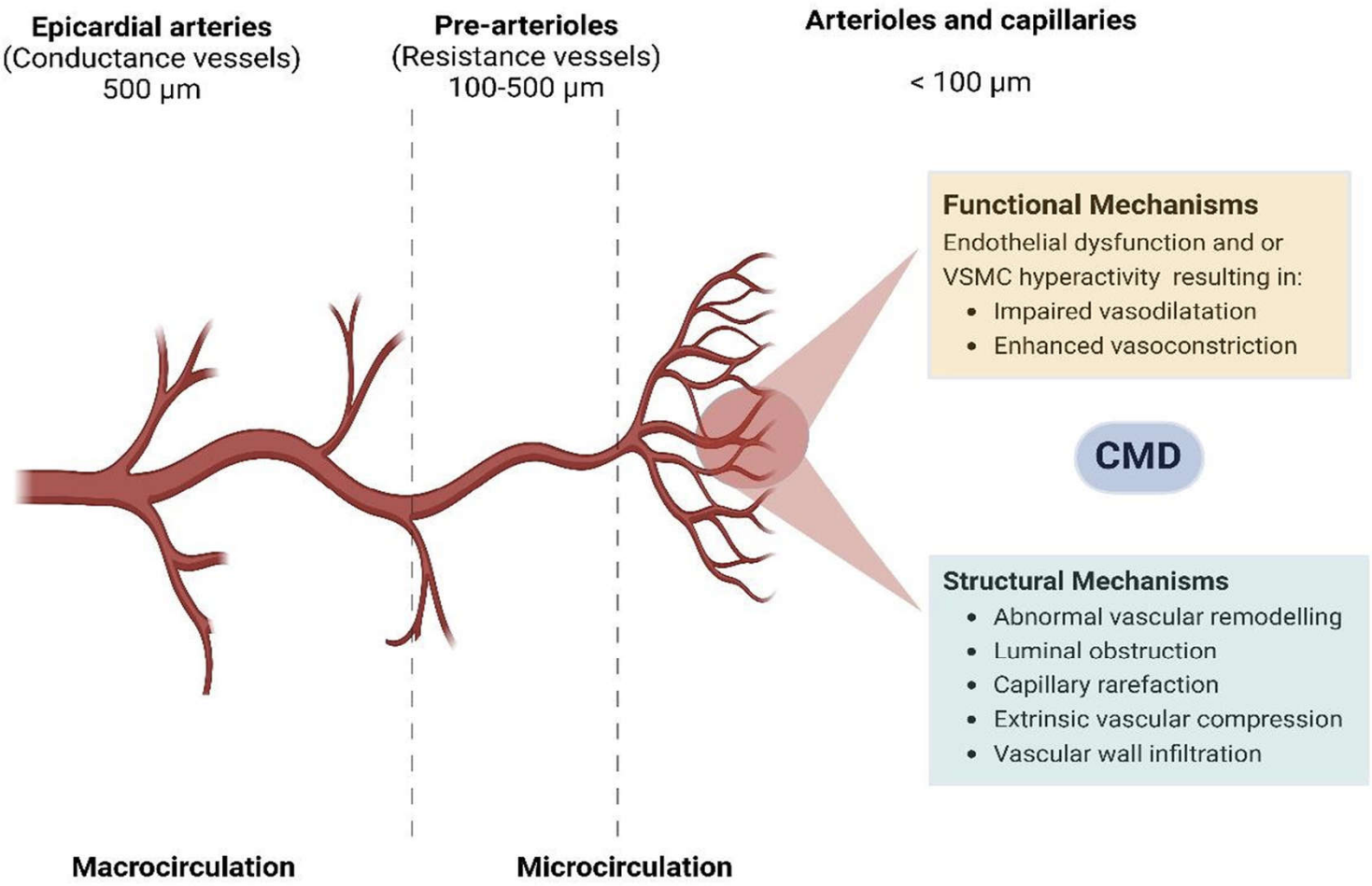


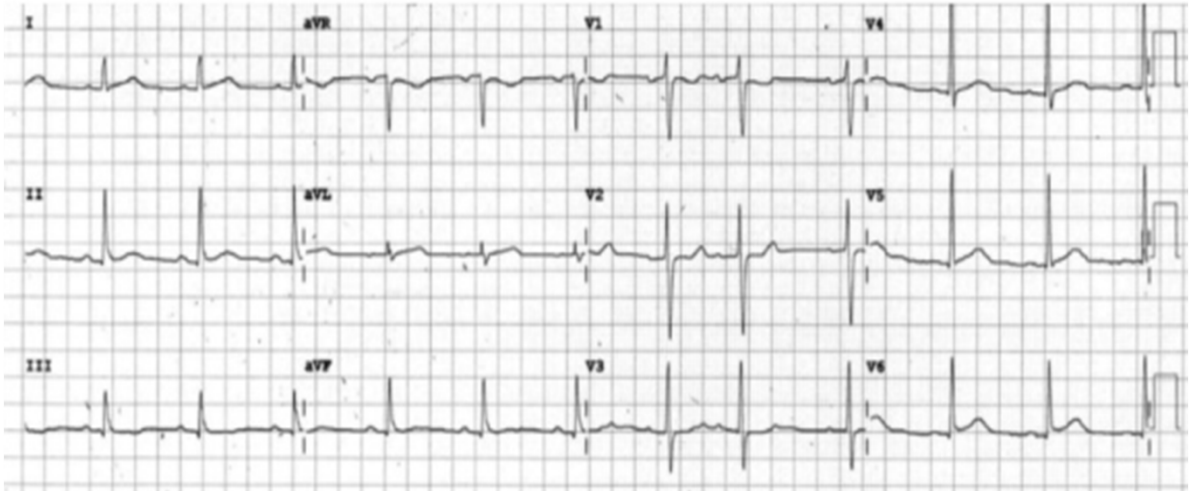
Figure 1: Pathophysiology of coronary microvascular dysfunction
(*Abbreviations: CMD: coronary microvascular dysfunction; VSMC: vascular smooth muscle cells)*

Vincenzo Scarica "Coronary microvascular dysfunction: Pathophysiology, Diagnosis and Therapeutic strategies across cardiovascular diseases"
EXCLI Journal 2025;24:454-478 – ISSN 1611-2156, published: March 26, 2025

Case 2

- Female, 54 years old.
- Chief complaint: Dyspnea and Angina.
- History of present illness: Six days prior to admission, the patient developed fatigue, nausea, and mild left-sided chest pain lasting approximately 1 minute, non-radiating, without fever.
- Physical examination: HR=75l/p; BP=130/80mmHg; SpO2=96%; Grade 2/6 systolic murmur at the apex, regular rhythm.
- Past medical history: No cardiovascular disease.

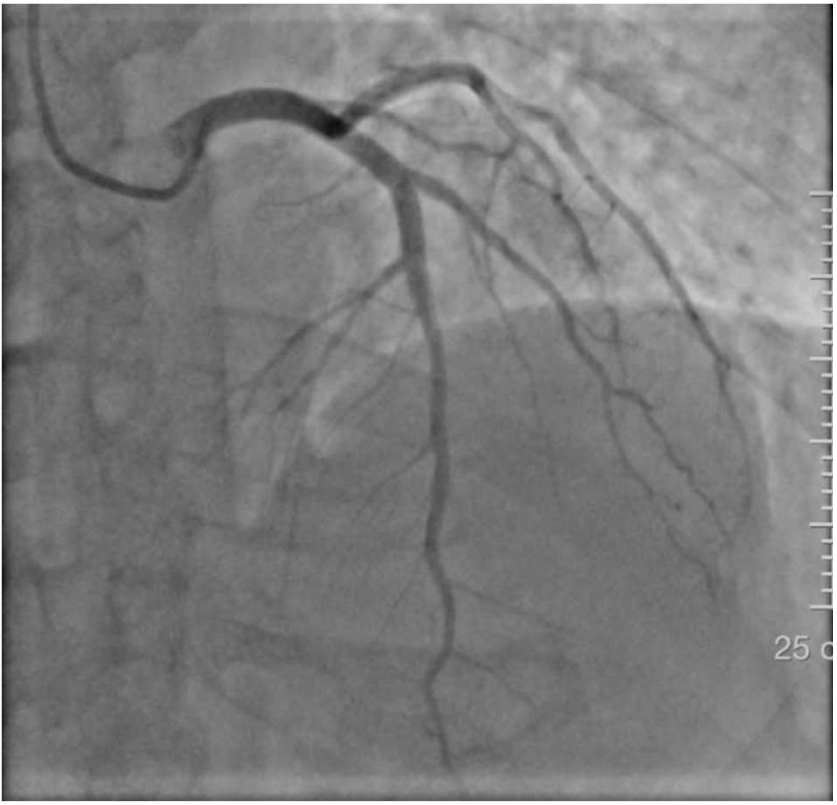
Paraclinical Findings

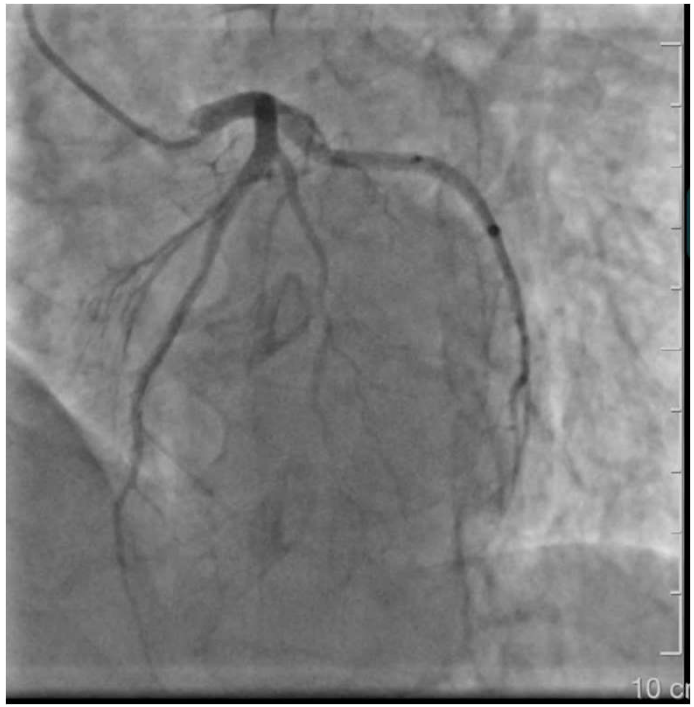


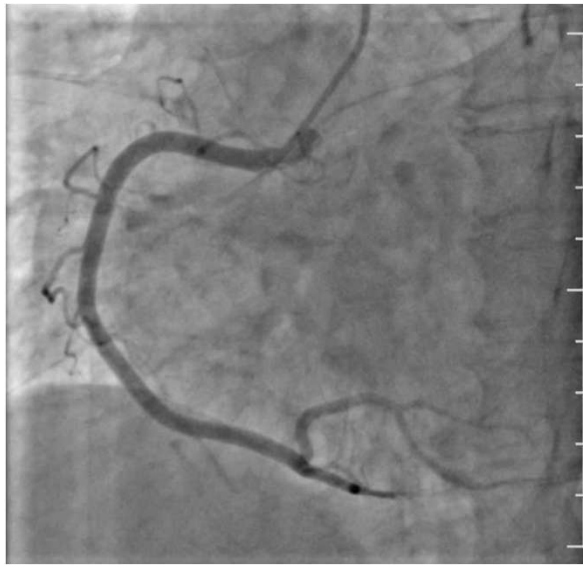
- Complete blood count:
  - WBC: 9.71K/ul, Hct: 41.9fL
  - CRP hs: **6.62** mg/L
  - Troponin I hs: **132.28** ng/L
  - NT-Pro BNP: 521 pg/mL
- Echocardiography: Hypokinesia of the lateral wall and mid interventricular septum, the inferior wall at the mid–apical segments of the left ventricle; LVEF = 44% (mildly reduced).
- ECG: Mild ST-segment elevation with T-wave inversion in leads DII, DIII, aVF, V4, V5, V6.

Acute ST-elevation myocardial infarction (STEMI)

Coronary Arteries / DSA

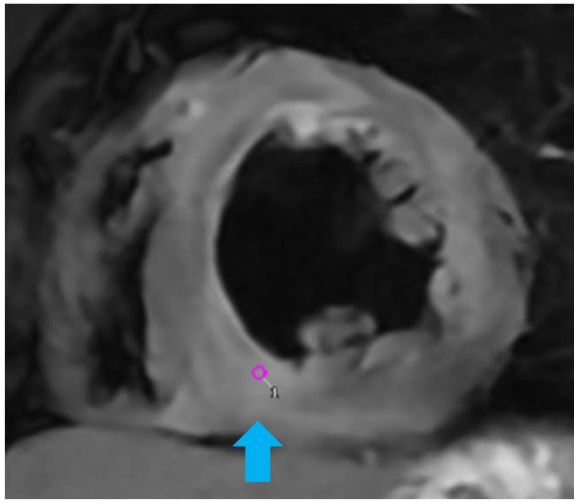


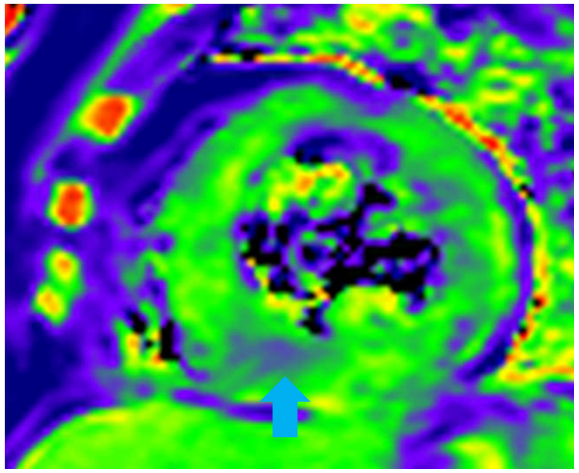




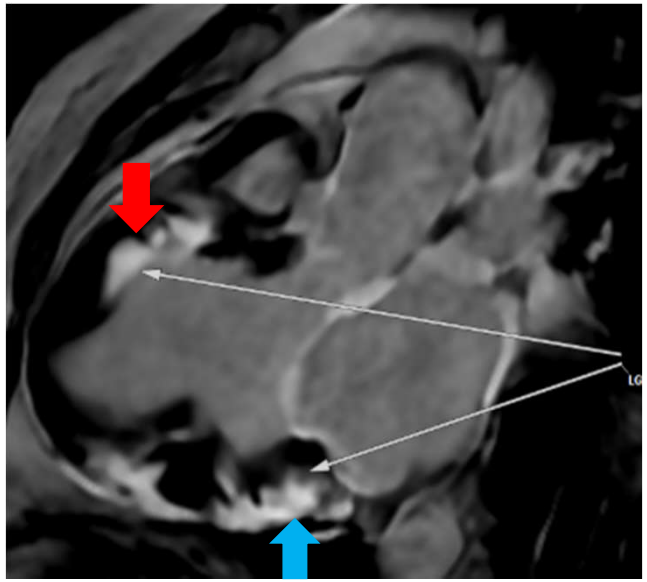
No stenosis of coronary arteries detected

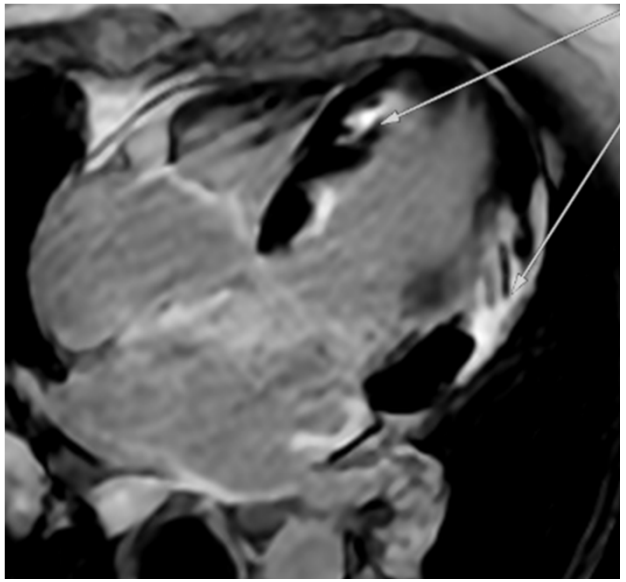
Acute Myocarditis Imaging / CMR





Subepicardial late gadolinium enhancement involving multiple myocardial segments → Myocarditis

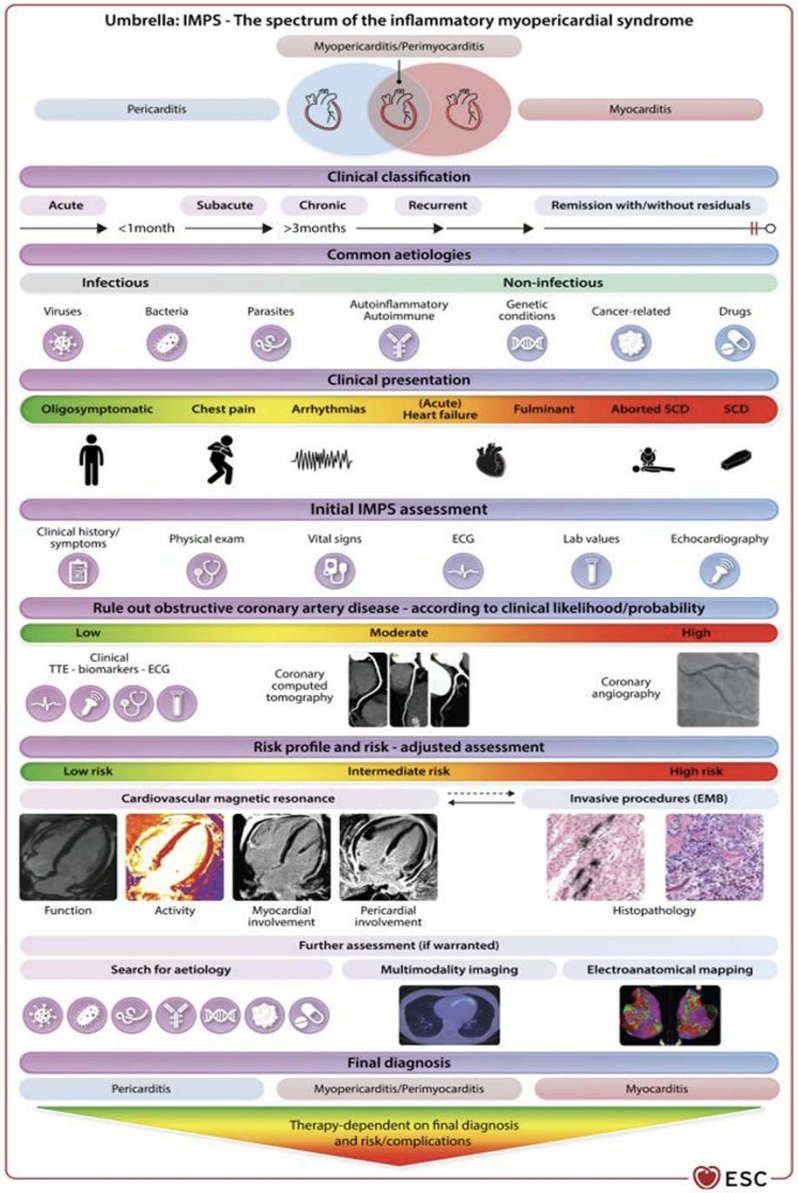


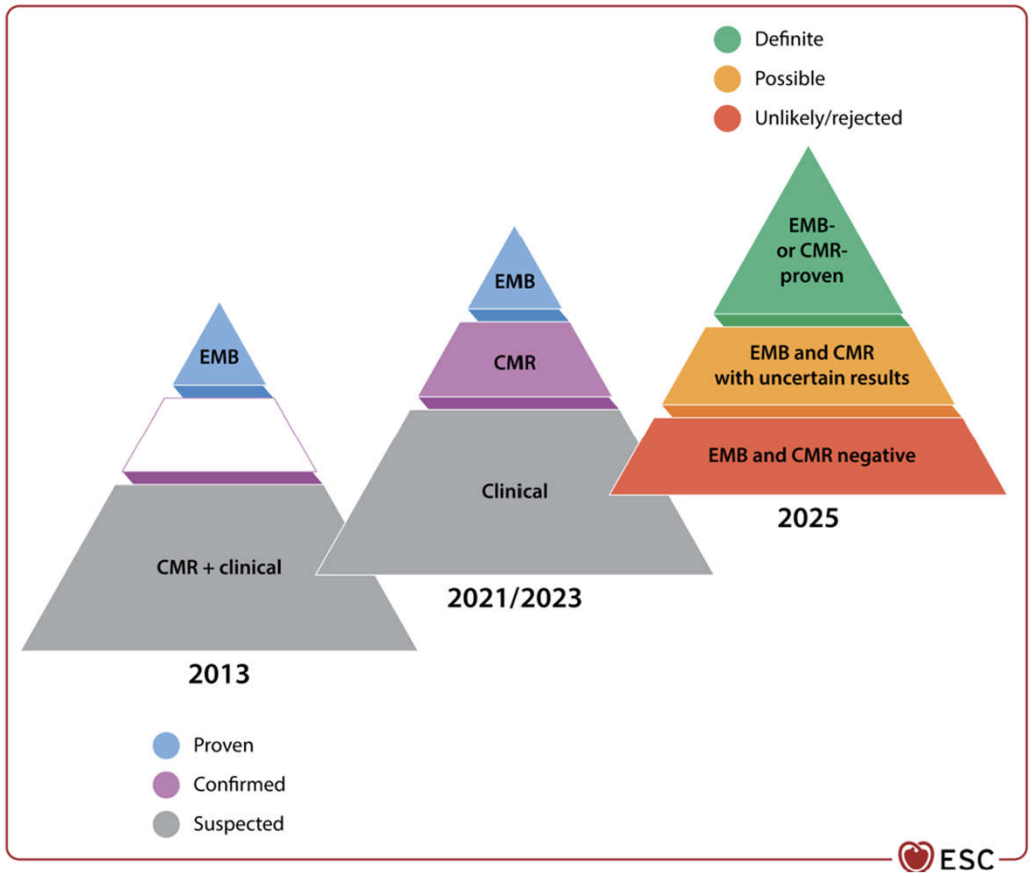


Lake Louise Criteria (2018):

- ❖ Regional increase in T2 signal (myocardial edema)
- ❖ Increased T1, ECV and regional LGE

→ **Acute myocarditis**





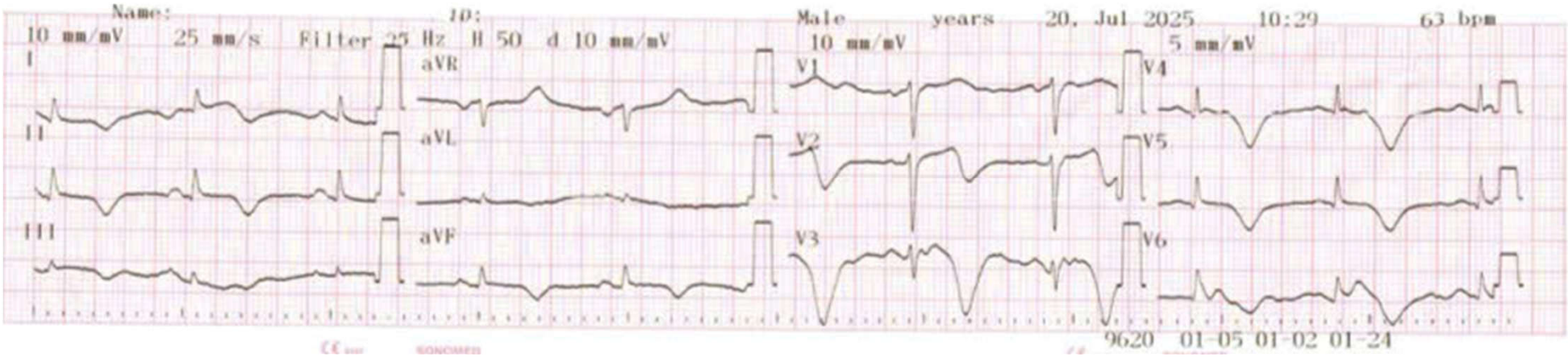
2025 ESC Guidelines for the management of myocarditis and pericarditis (European Heart Journal; 2025 – doi: 10.1093/eurheartj/ehaf192)

Case 3

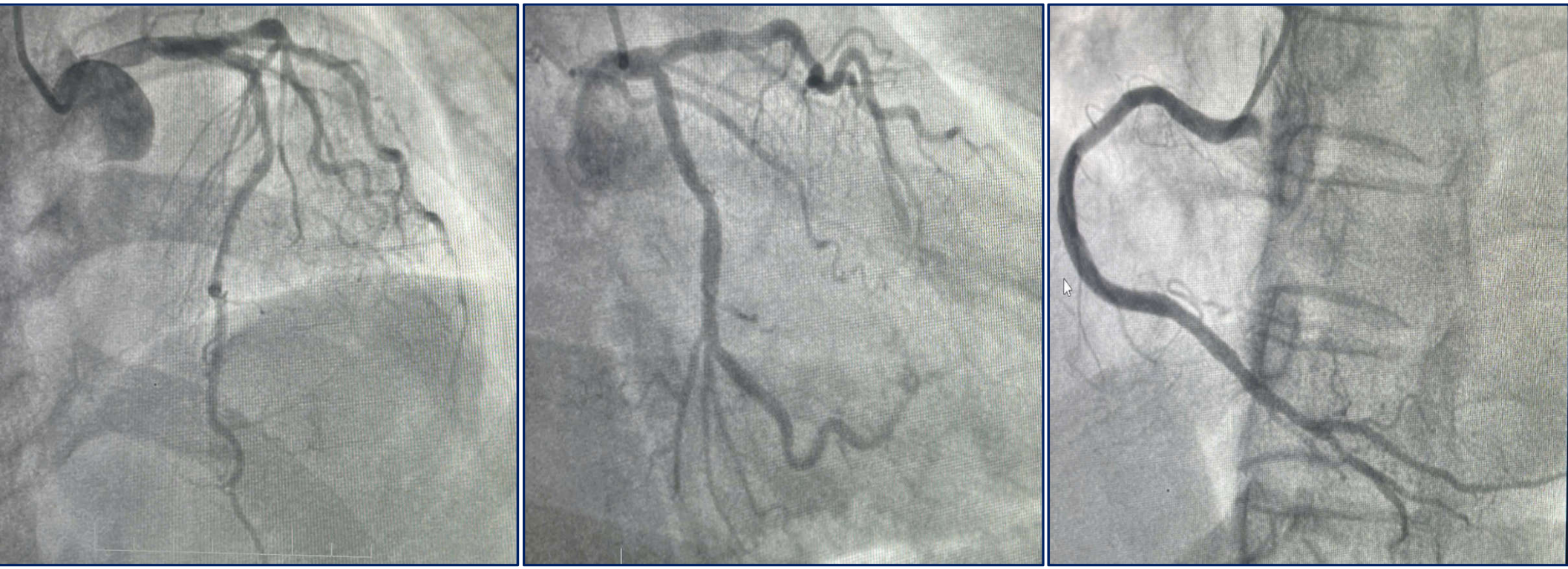
- 70-year-old female.
- Address: Tan Chau, Tay Ninh.
- Chief complaint: Dyspnea and Angina.
- Present illness history: One week prior to admission, the patient experienced family related stress, followed by a sensation of tight, non-radiating pain but dyspnea. No fever and no diarrhea.
- Past medical history: Depression, irregularly treated.

Paraclinical findings

Yêu cầu xét nghiệm	Kết quả xét nghiệm	Khoảng tham chiếu		Máy XN	Mã QTXN
Sinh Hóa					**XN/QTKT**
Creatinin	75.5	58 - 96	umol/L	DXC 700	SH.61
eGFR (CKD-EPI 2021)	**73.33**	≥ 90	ml/Phút /1.73m2		
SGOT (AST)	**44.19**	< 35	U/L	DXC 700	SH.66
SGPT (ALT)	19.76	< 35	U/L	DXC 700	SH.67
Miễn Dịch					**XN/QTKT**
TROPONIN I hs	**1768.1**	Nam: 0 - 34.2 Nữ: 0 - 15.6	pg/mL	Alinity CI	MD.47

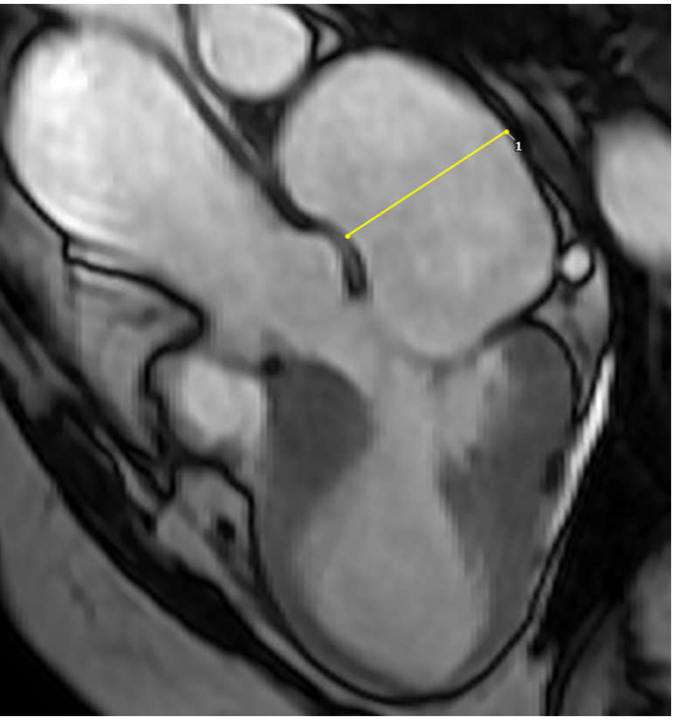


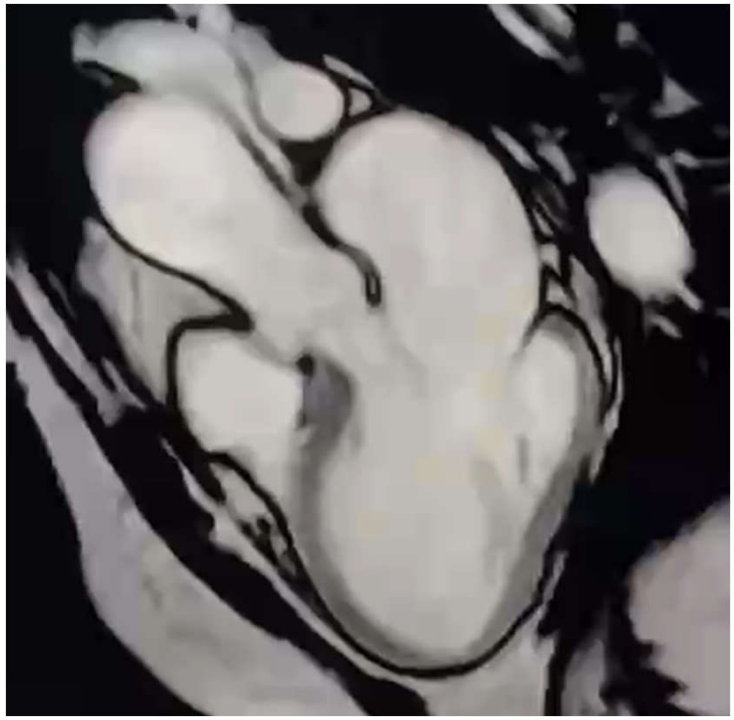
Coronary angiography intervention results

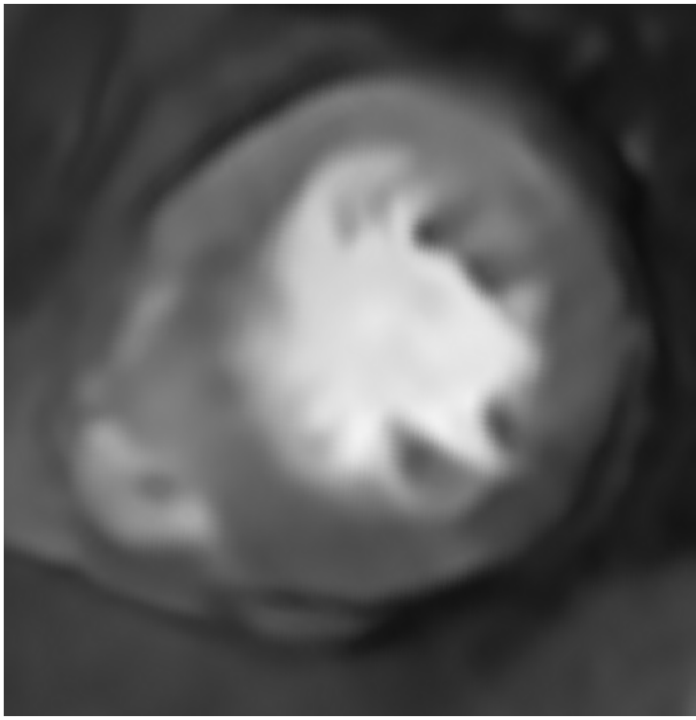


No stenosis of coronary arteries detected

Takotsubo cardiomyopathy/ CMR

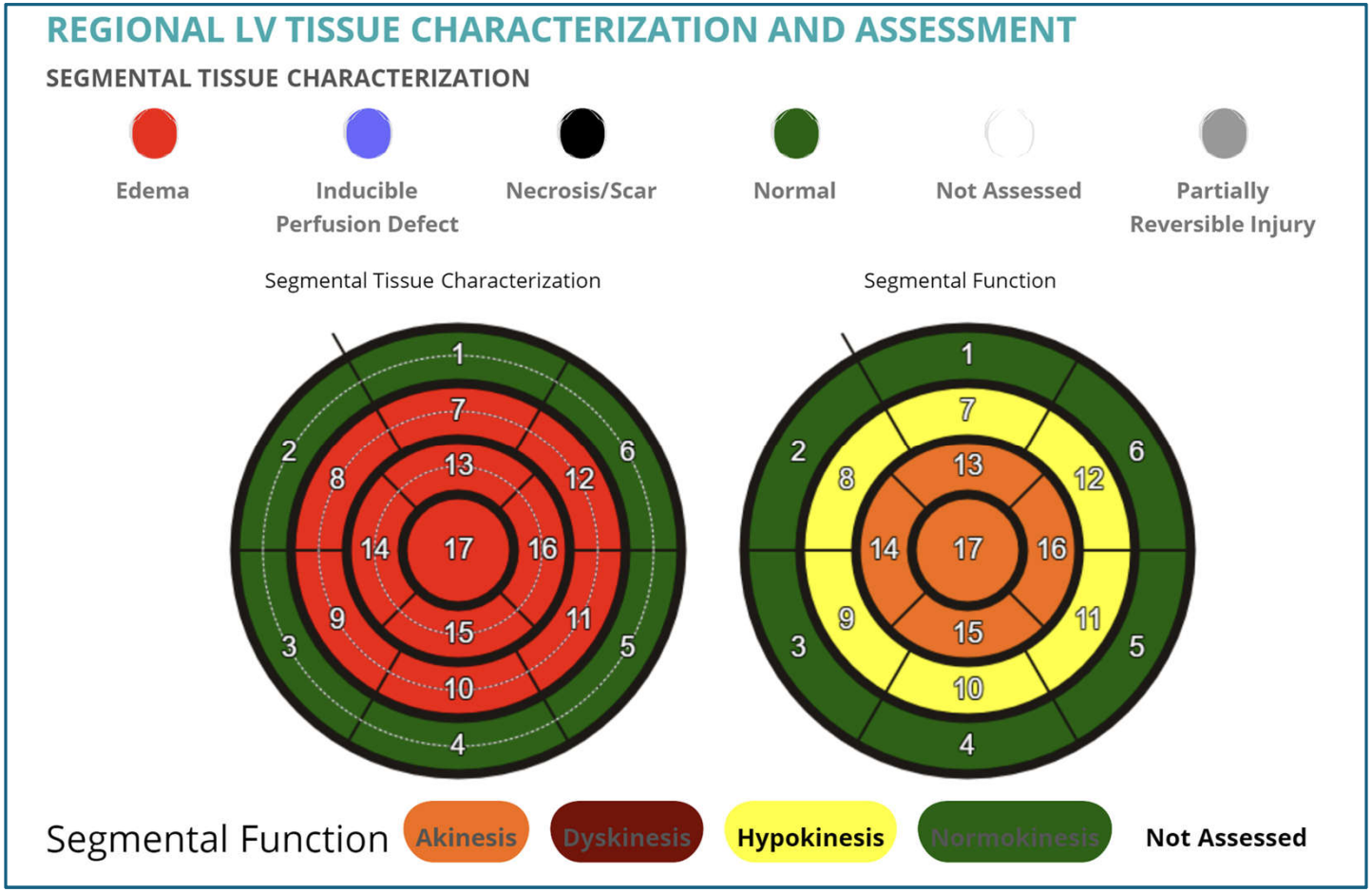


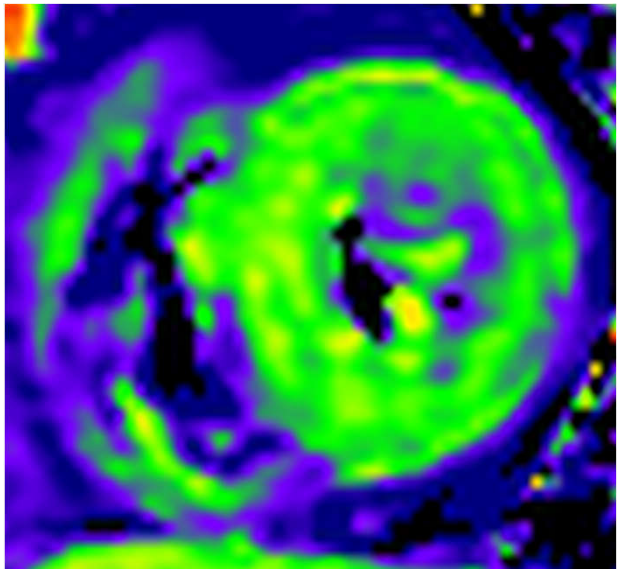


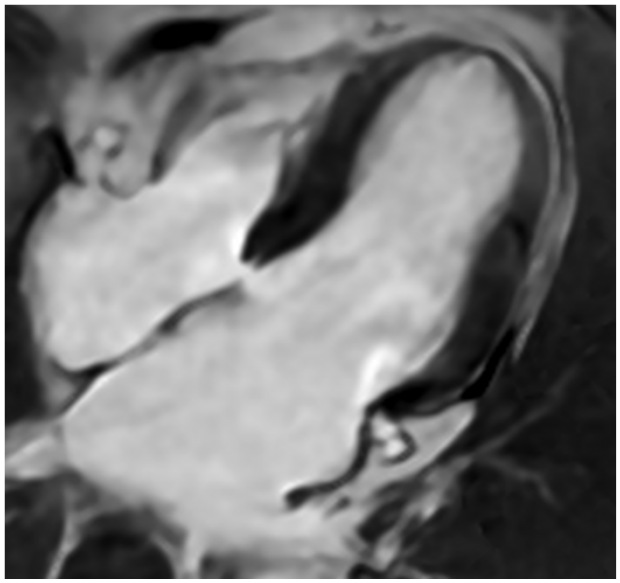


Focal aneurysmal dilation of the left ventricular apex, with mildly reduced left ventricular systolic function (LVEF = 40%); preserved right ventricular function (RVEF = 66%); Takotsubo Type I.

Perfusion (-)

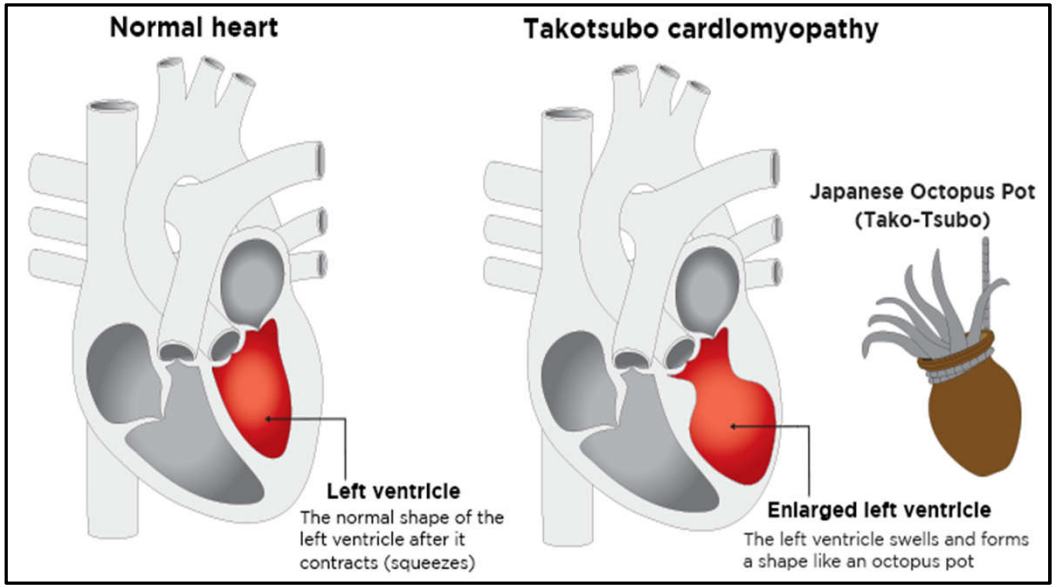






Myocardial edema with increased signal intensity on T2 mapping, involving the mid to apical segments of the left ventricle; No late gadolinium enhancement-LGE (-)

TAKOTSUBO



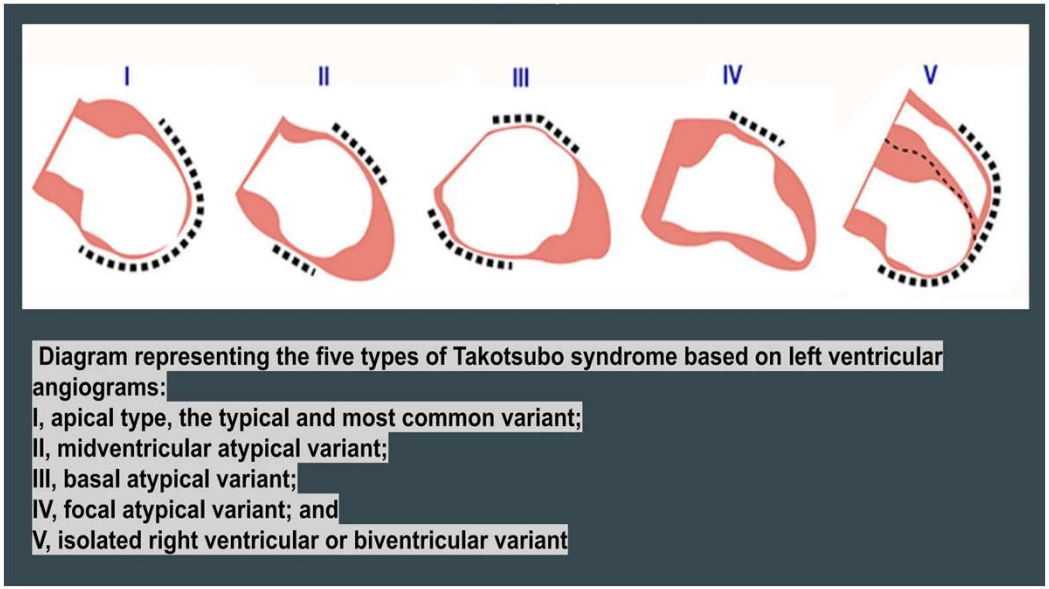
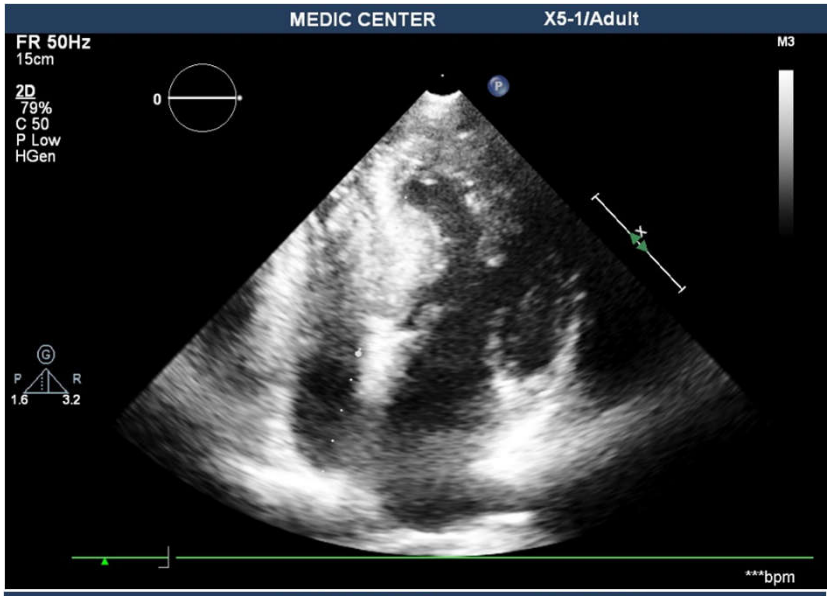


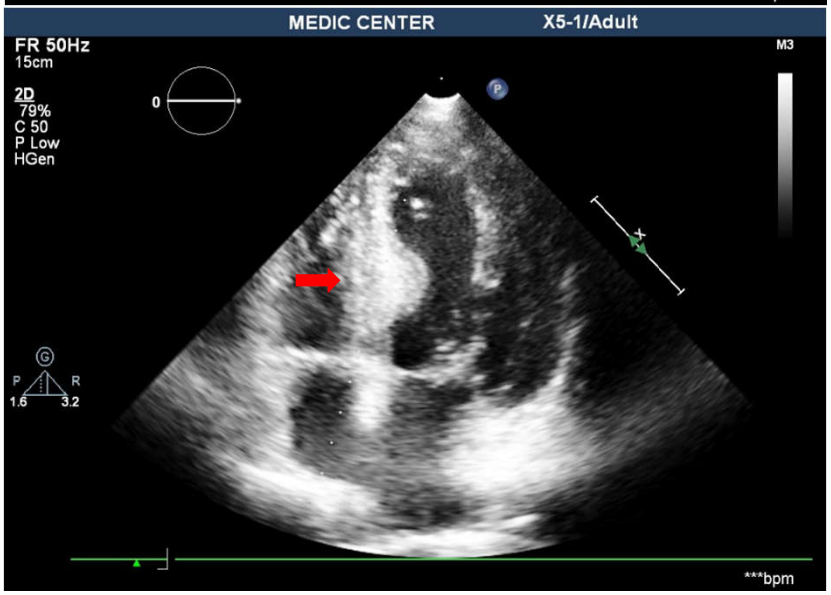
Figure One: This figure highlights the differences between the left ventricle in a normal heart and one with TTS. https://www.heartfoundation.org.nz/your-heart/heart-conditions/takotsubo-cardiomyopathy

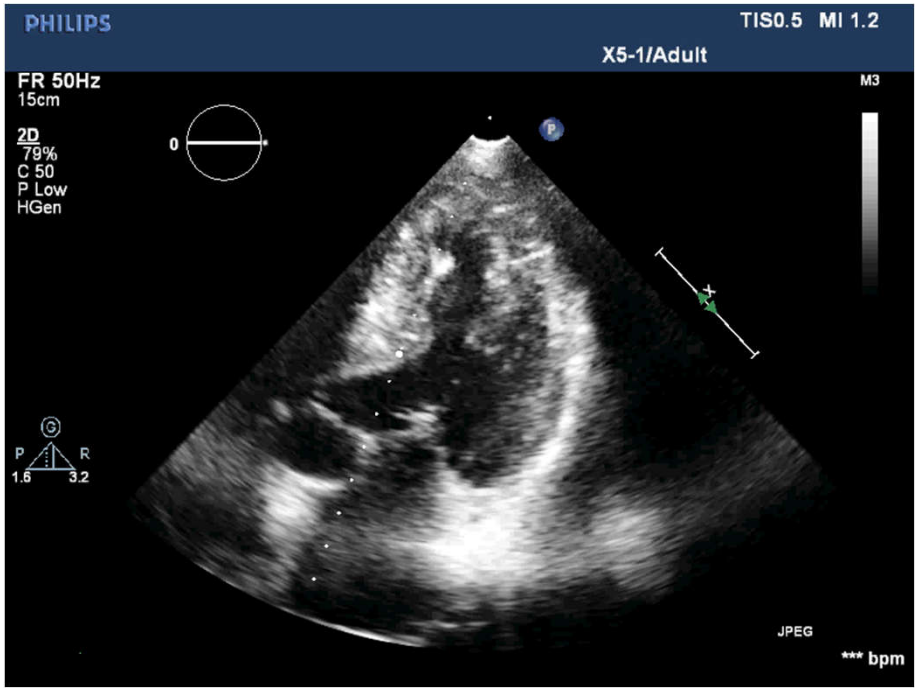
Case 4

- 51-year-old male.
- Angina pectoris on exertion.
- No history of hypertension, no smoking, no family history of cardiovascular disease
- ECG: Left ventricular hypertrophy and myocardial ischemia.
- Laboratory results: High Troponin I hs: 98 ng/L; hs CRP within normal limits.

Echocardiography

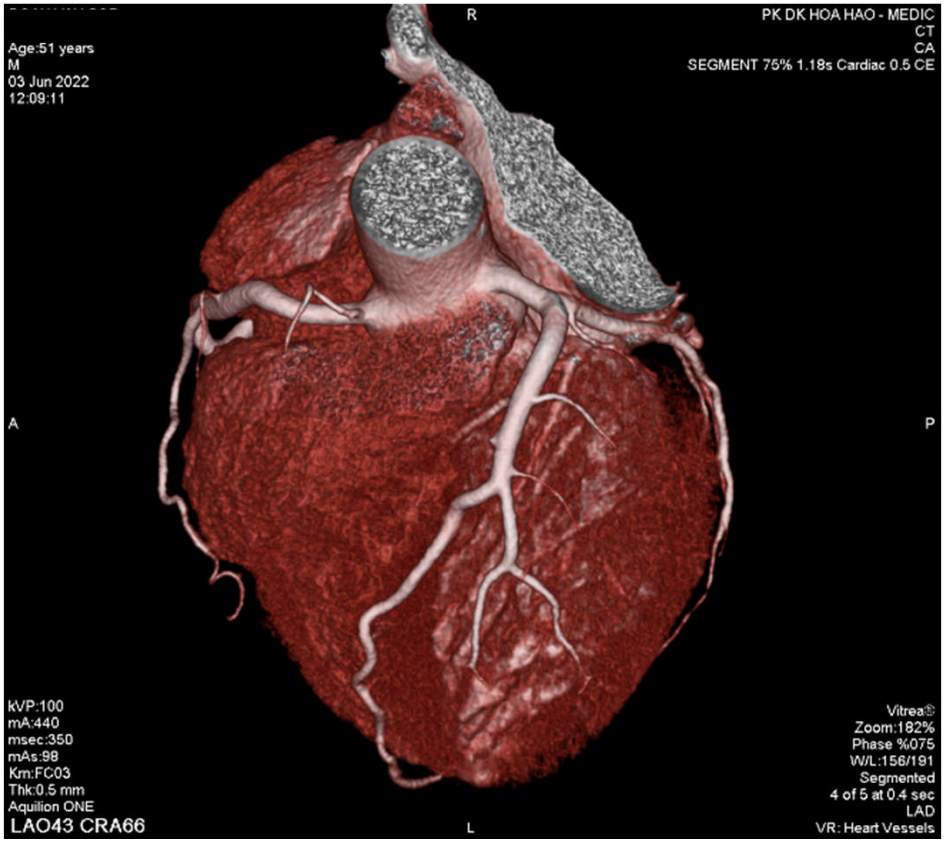


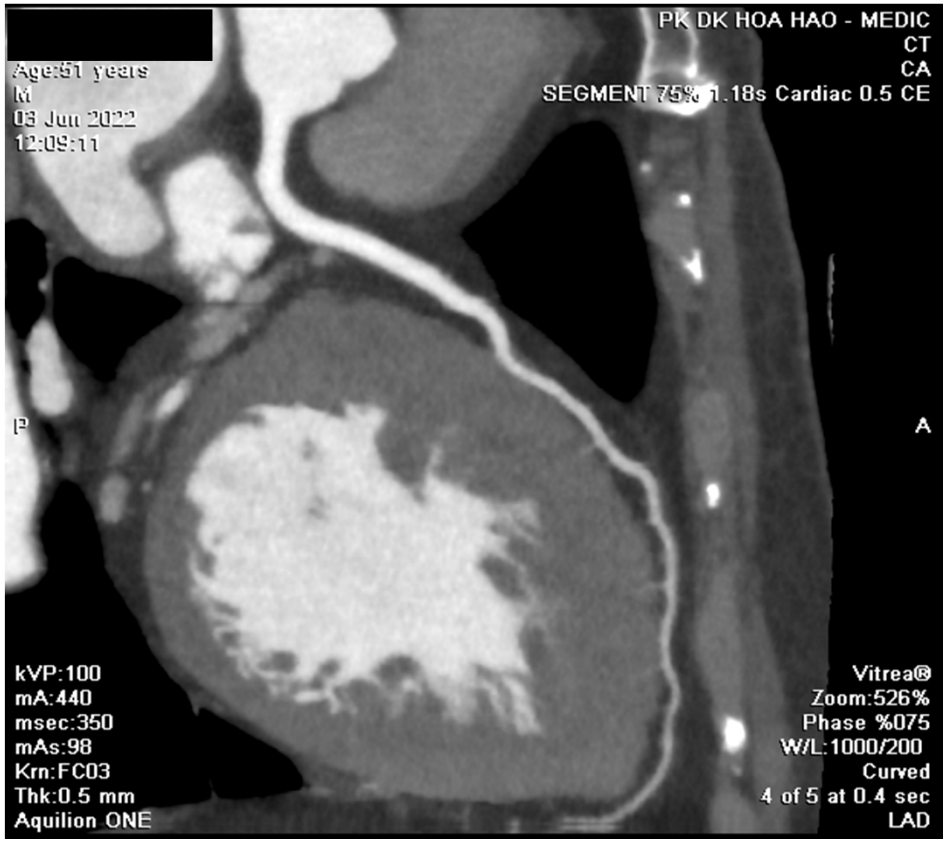




Findings consistent with Hypertrophic cardiomyopathy - Sigmoid, (Type I), SAM (+).

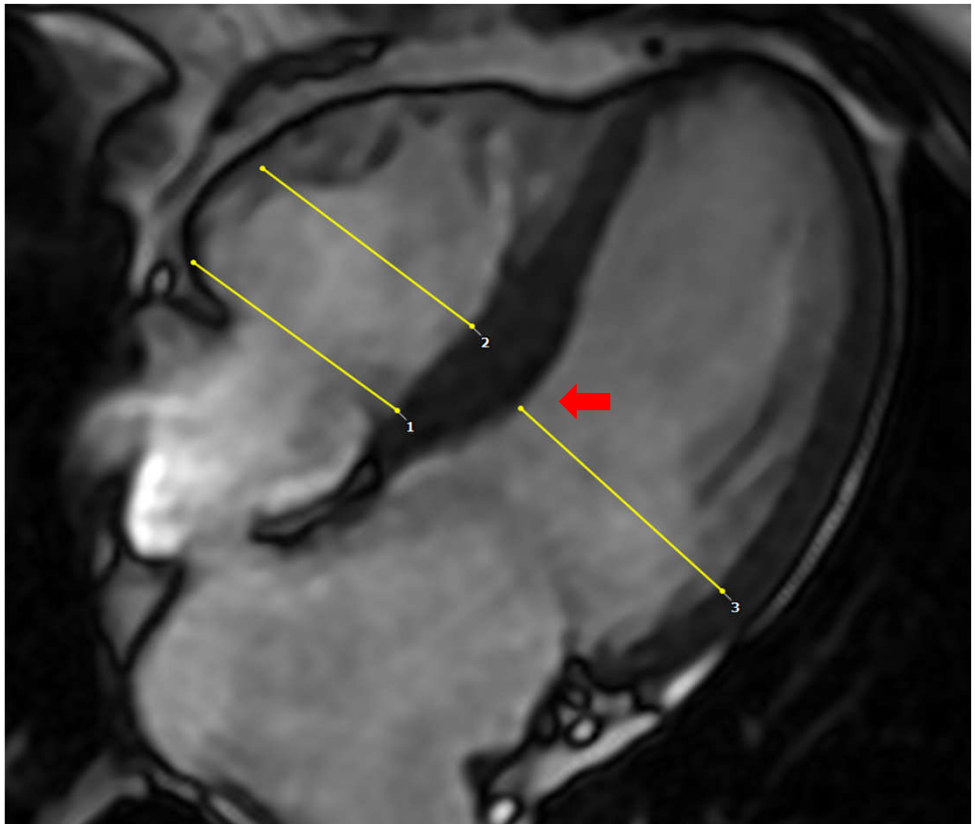
Contrast enhanced coronary MSCT

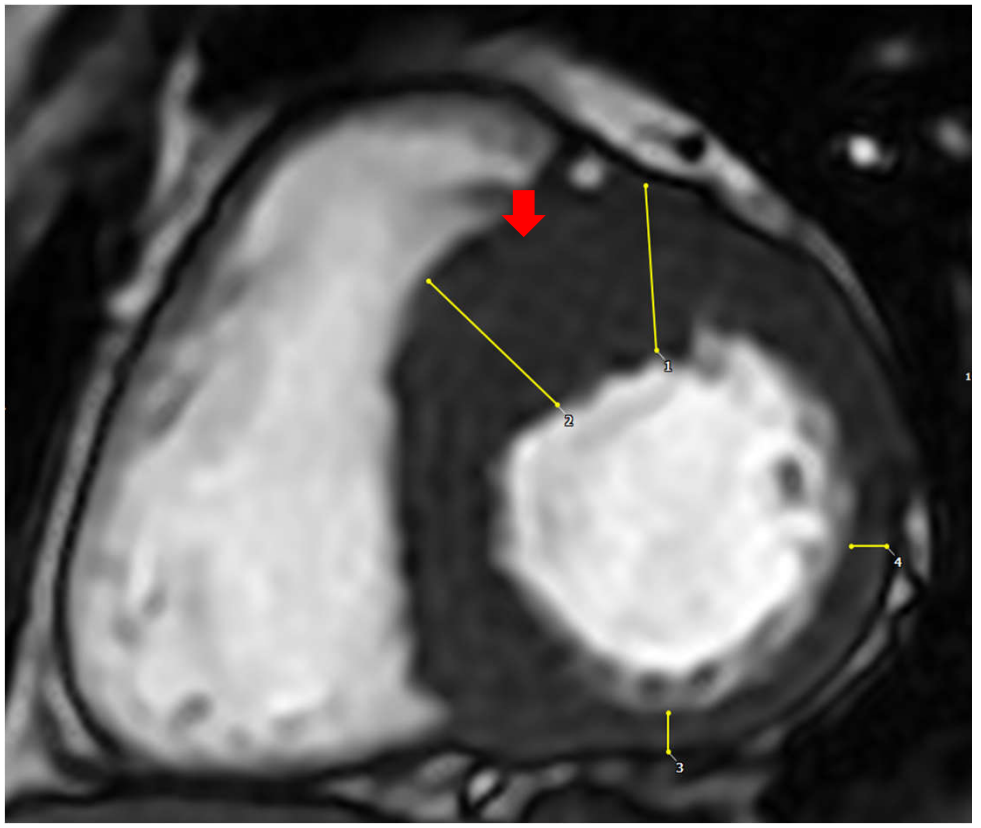




No stenosis of coronary artery, myocardial bridge at LAD II

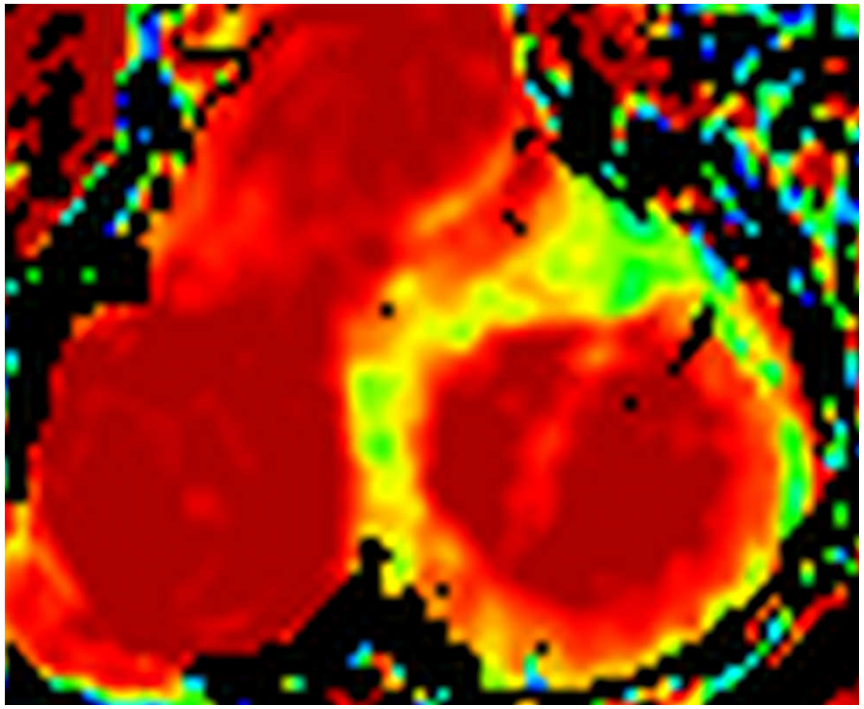
Cardiac MRI





Sigmoidal HCM, severe hypertrophy of the basal anterior and anteroseptal wall, SAM (+), LVOTO (-), LVEF= 75%.

LGE, ECV, Native T1/MRI



GLOBAL LV TISSUE CHARACTERIZATION

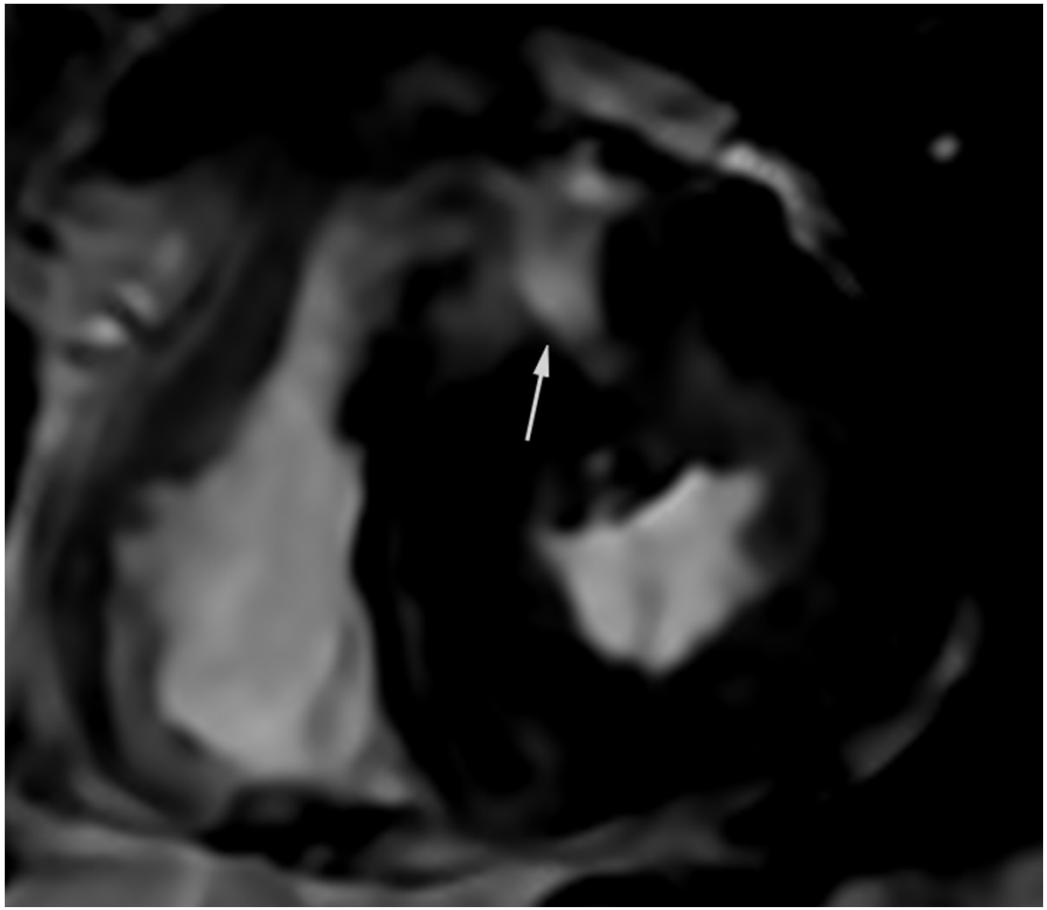
Late Gd Enh. Mass	3 g
Late Enh. / LV Mass	3 %

Map Source : CircleCVI via GE MEDICAL SYSTEMS

T1

GLOBAL

NAME	NATIVE T1	POST CONTRAST T1	ECV VALUE
Myo	989 ± 126 ms	528 ± 161 ms	35 ± 8 %



Conclusion

- CMR is useful in identifying the cause of MINOCA.
- Differentiate true myocardial infarction: Myocarditis, Takotsubo syndrome and other cardiomyopathies.
- Prognostic value by assessing myocardial edema, necrosis, late gadolinium enhancement (LGE).
- Appropriate, individualized treatment strategies.

Thank you for Listening!