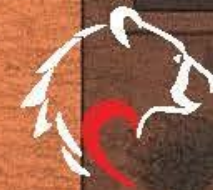


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LBBAP: esperienze di real life

Dr. E. Boggio



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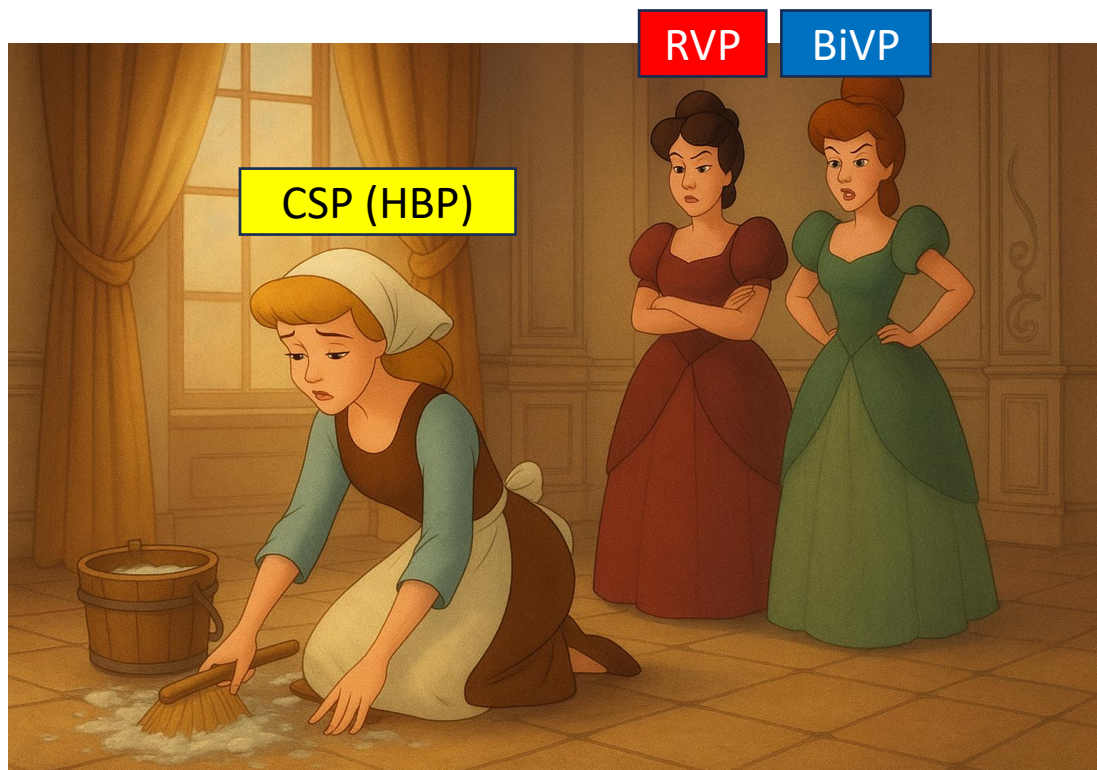


La stimolazione del sistema di conduzione fisiologico

Disney
A
Cinderella
Story



C'era una volta...



ESC

European Society
of Cardiology

European Heart Journal (2021) 00, 1–94
doi:10.1093/eurheartj/ehab364

ESC GUIDELINES

2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

Developed by the Task Force on cardiac pacing and cardiac resynchronization therapy of the European Society of Cardiology (ESC)

HBP may be considered as an alternative to RV pacing in patients with AVB and LVEF >40%, who are anticipated to have >20% ventricular pacing.^{42,433}

IIb

C

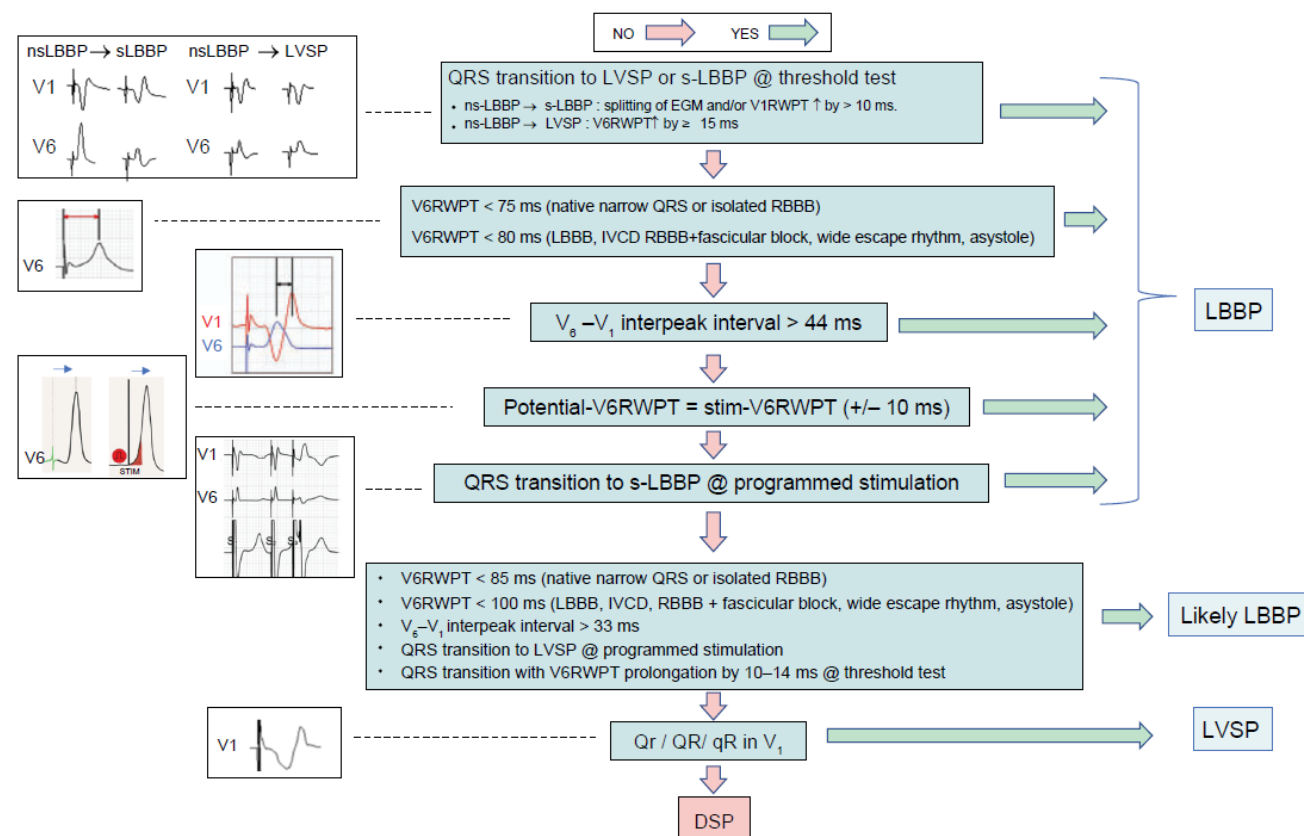
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...finchè un bel giorno...

EHRA clinical consensus statement on conduction system pacing implantation: endorsed by the Asia Pacific Heart Rhythm Society (APHRS), Canadian Heart Rhythm Society (CHRS), and Latin American Heart Rhythm Society (LAHRS)

Haran Burri^{1*}, Marek Jastrzebski², Óscar Cano^{3,4}, Karol Čurila⁵, Jan de Pooter⁶,
Weijian Huang⁷, Carsten Israel⁸, Jacqueline Joza⁹, Jorge Romero¹⁰, Kevin Vernooy¹¹,
Pugazhendhi Vijayaraman¹², Zachary Whinnett¹³, and Francesco Zanon¹⁴



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...e divenne la regina del ballo

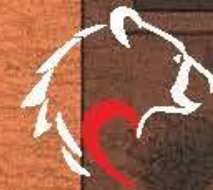


CSP
(HBP + LBBAP)

European Society of Cardiology (ESC) clinical consensus statement on indications for conduction system pacing, with special contribution of the European Heart Rhythm Association of the ESC and endorsed by the Asia Pacific Heart Rhythm Society, the Canadian Heart Rhythm Society, the Heart Rhythm Society, and the Latin American Heart Rhythm Society

Glikson M. et al.

	Atrioventricular block			Heart failure		
	LVEF $\geq 50\%$	LVEF 40–49%	LVEF $<40\%$	LVEF $<40\%$ HF $\neq$ EF	LVEF 40–49% HF $\neq$ EF	LVEF $\geq 50\%$ HF $\neq$ EF
CSP	PhysioVP-AF, CSP vs. RVP n = 400			CSP-SYNC, CSP vs. BIVP n = 62 NCT06342492, CSP vs. surgical epicardial LV lead n = 100	ABACUS, CSP+AVNA vs. AF ablation n = 220	
	PHYSAPV, CSP vs. RVP n = 200	PROTECT UP, Upgrade to CSP vs. RVP n = 155		HIS-alt_2, CSP vs. BIVP n = 125		
	PHYS-TAVI III, CSP vs. RVP n = 24 and 48			HIS alternative II, CSP vs. BIVP n = 40		
		PROTECT HF, CSP vs. RVP n = 2600		CONSYST-CRT, CSP vs. BIV CRT n = 130		
	HIS-PiEF, HBP vs. RVP n = 40			PhysioSync-HF, CSP vs. BIVP n = 304		
				CONSYST-CRT II, CSP vs. BIV CRT n = 320		
		LEFT vs. LEFT RCT, CSP vs. BIV CRT n = 2136		CSP-UPGRADE, CSP vs. BIVP n = 66		
LBBAP				CONDUCT-AF, CSP+AVNA vs. BIVP+AVNA n = 82		
				HIS-CRT, CSP vs. BIVP n = 120		
				LIT-HF, CSP vs. OMT n = 120	PACE-FIB, CSP+AVNA vs. OMT n = 334	
		ESCPAND, CSP vs. RVP n = 75			RAFT-Preserved, CSP vs. BIVP vs. OMT n = 370	
	Protect-Sync, LBBAP vs. RVP n = 450				EARLY-RESYNC, LBBP vs. OMT n = 60	
	BOSTON PACE, LBBAP vs. RVP n = 100				LBBP Noninferior CRT, LBBP vs. BIVP n = 160	
	PLANET, LBBAP vs. RVP n = 30					
		OptimPacing, LBBAP vs. RVP n = 683		LEFT-BUNDLE-CRT Trial, LBBAP vs. BIVP n = 176		
	STAY, LBBAP vs. RVP n = 75				LBBAP-AFHF, LBBAP vs. BIVP n = 60	
		LEFT-HF, LBBAP vs. RVP n = 1300			RAFT-P&A, CSP+AVNA vs. OMT n = 600	
LOT-CRT	STYLE-LBBP, LBBAP SOL vs. LLL n = 120					
	Left Bundle BRAVE, LBBP vs. RVP n = 46	LBBP in TAVI, LBBP vs. RVP n = 50		LeCaRT, LBBAP vs. CRT n = 170		
	LEAP-CAR, LBBP vs. RVP n = 130			RECOVER-HF, LBBP vs. BIVP n = 60		
	LEAP-Block, LBBAP vs. RVP n = 450					
	LEAP-pilot, LEAP, LBBAP vs. RVP n = 470			BATTLE, LOT-CRT vs. BIVP, n = 86		
				RESCUE, LOT-CRT vs. LBBAP vs. BIVP n = 30		



Caso 1: INDIVIDUARE SEMPRE L'USCITA DI EMERGENZA!

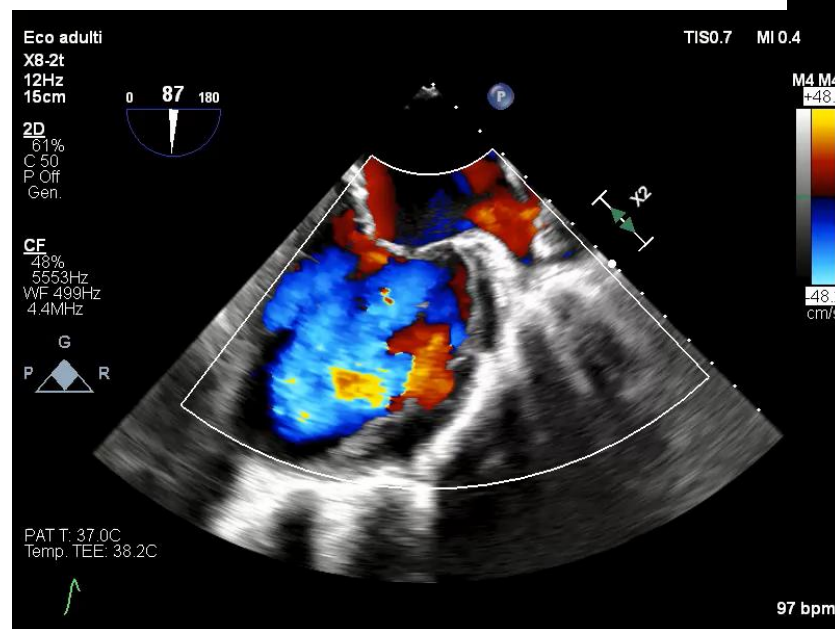
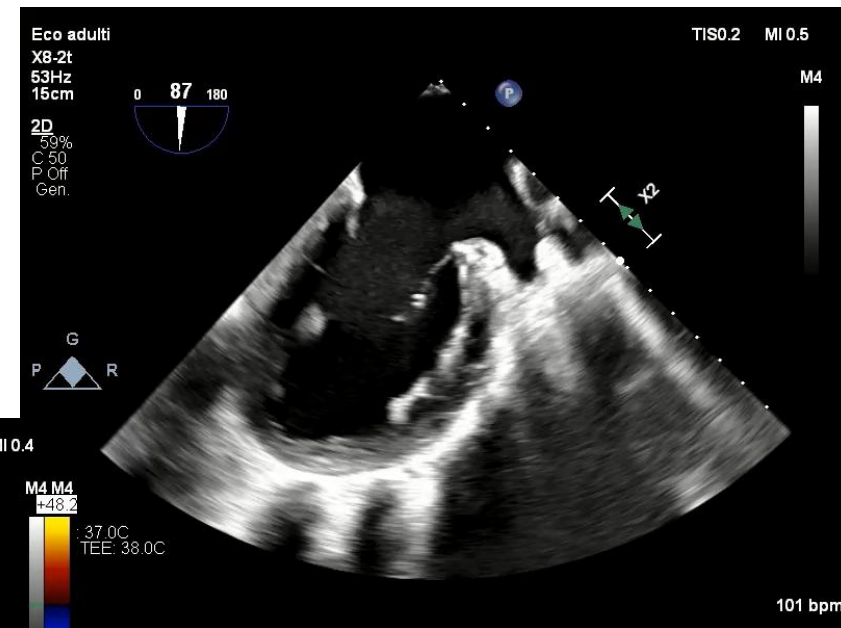
F, 73 aa

Ipertensione arteriosa

CMPD a coronarie esenti da stenosi significative

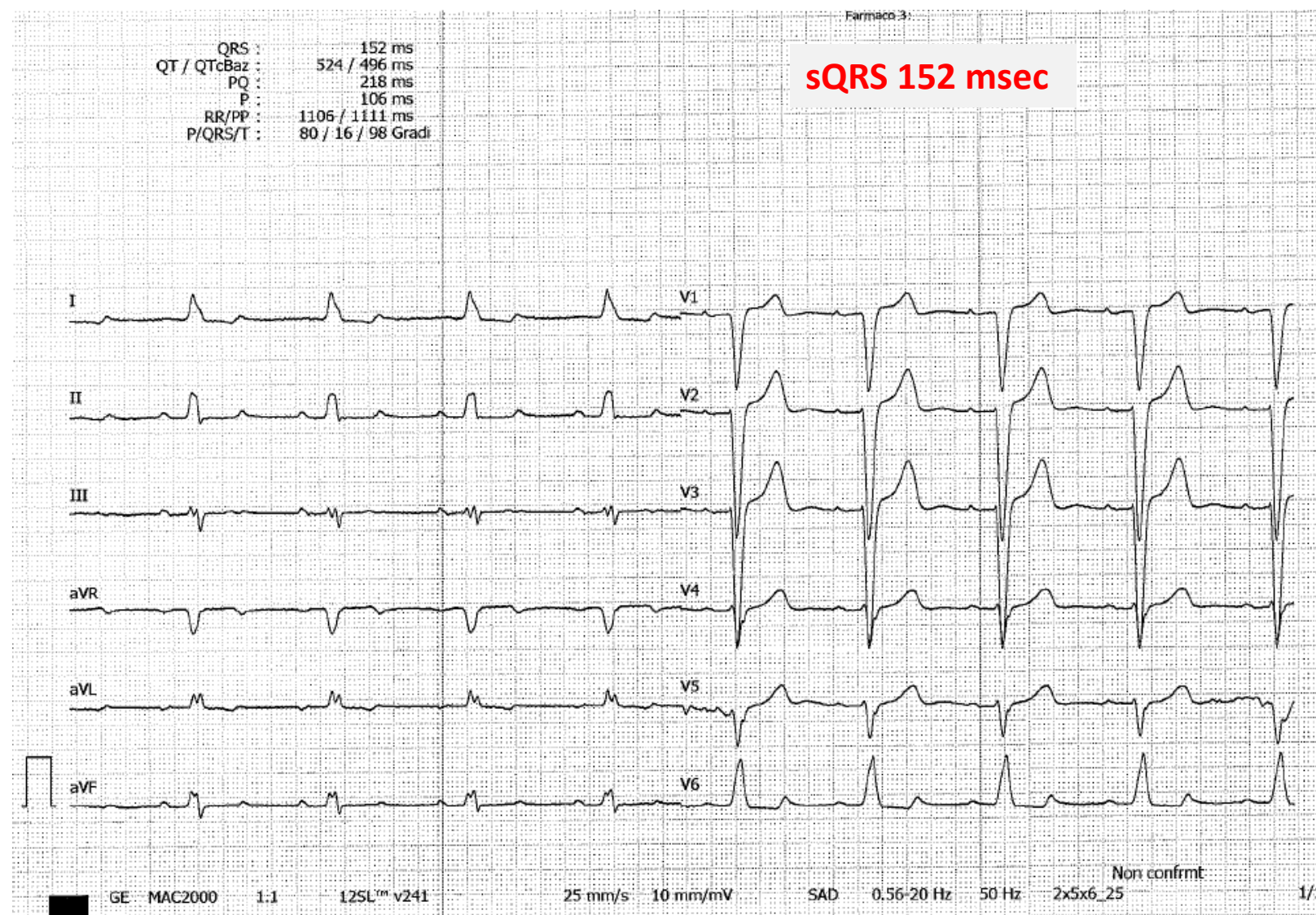
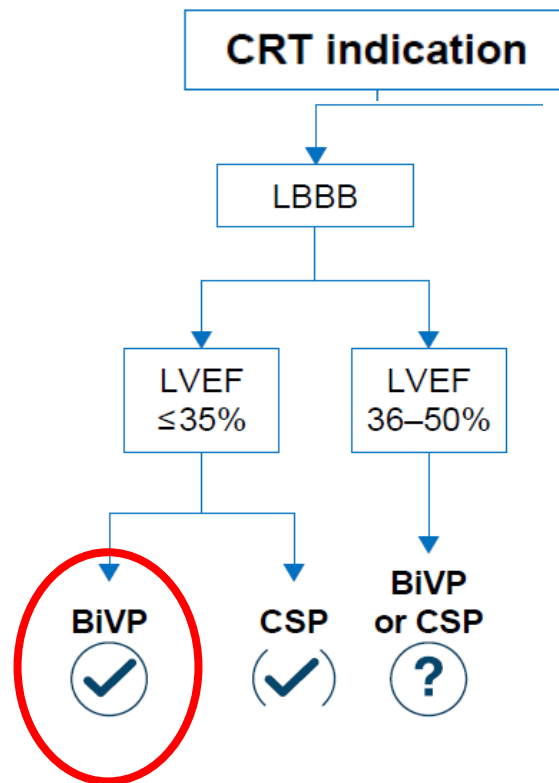
Pregressi ricoveri per SCC nonostante OMT

FE 31%, VSx dilatato, IM moderata-severa



VTD 144 ml

PAPs 40 mmHg



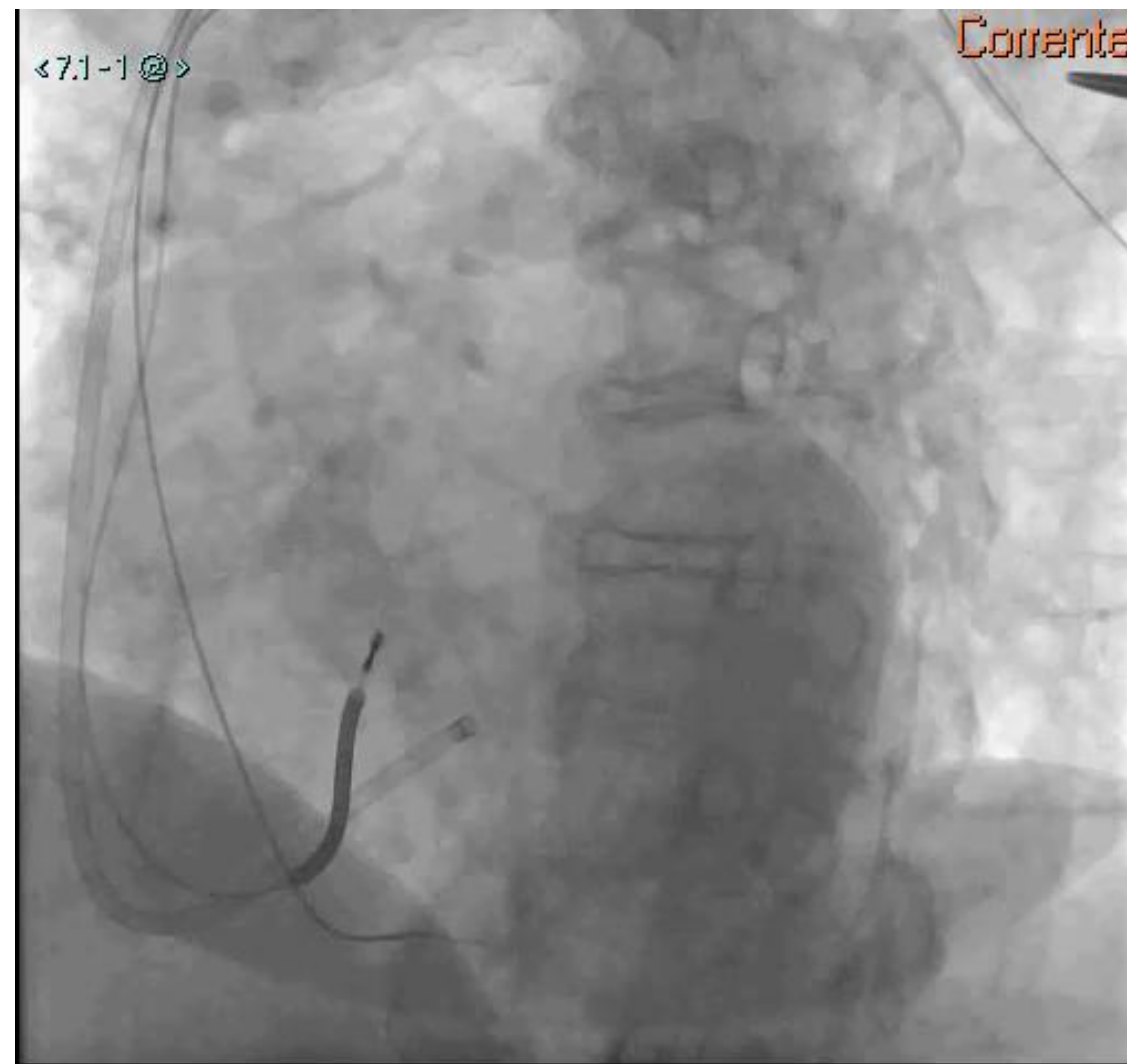
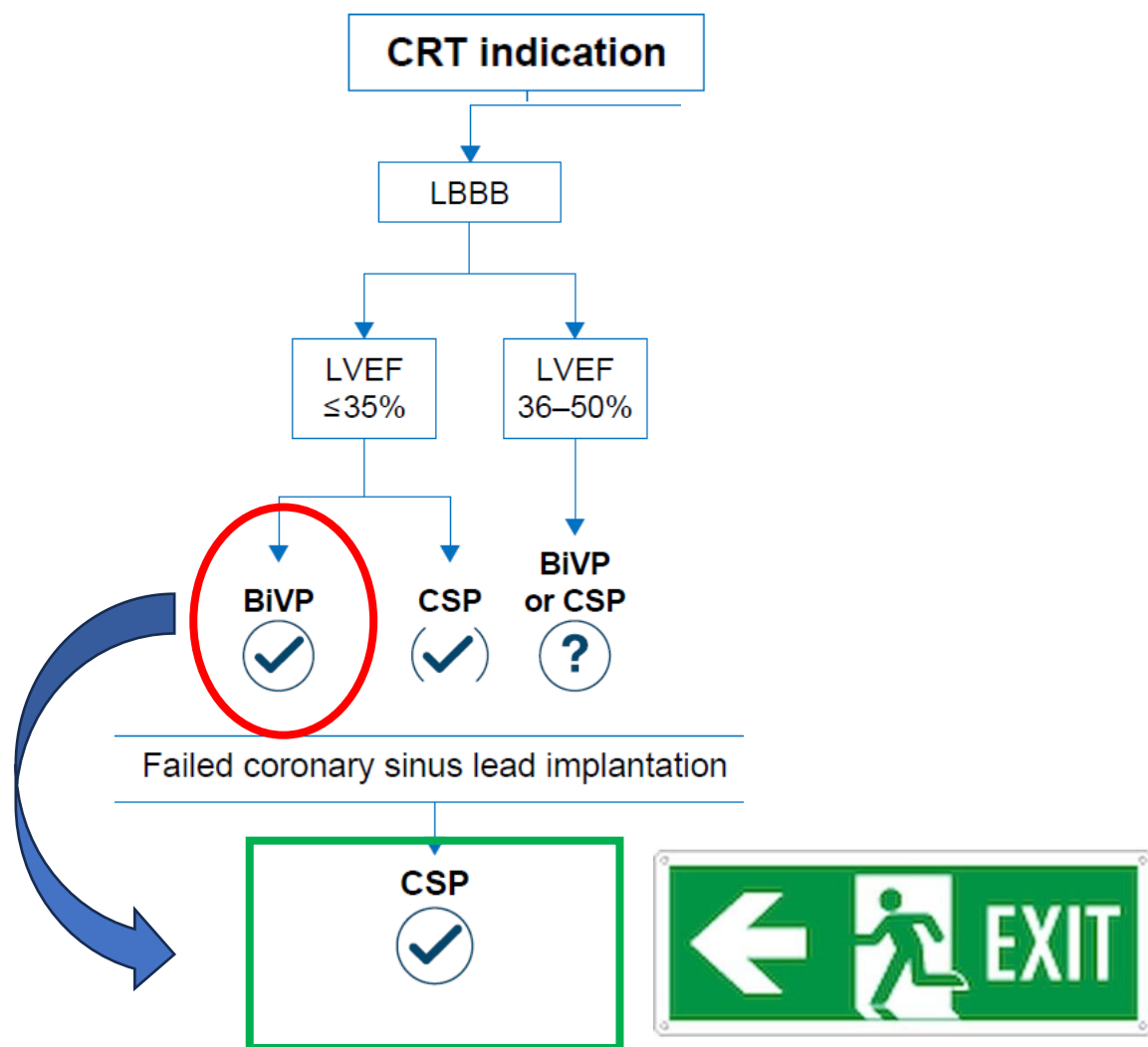
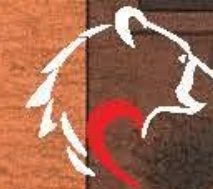
BIELLA CUORE

12-13 SETTEMBRE 2025



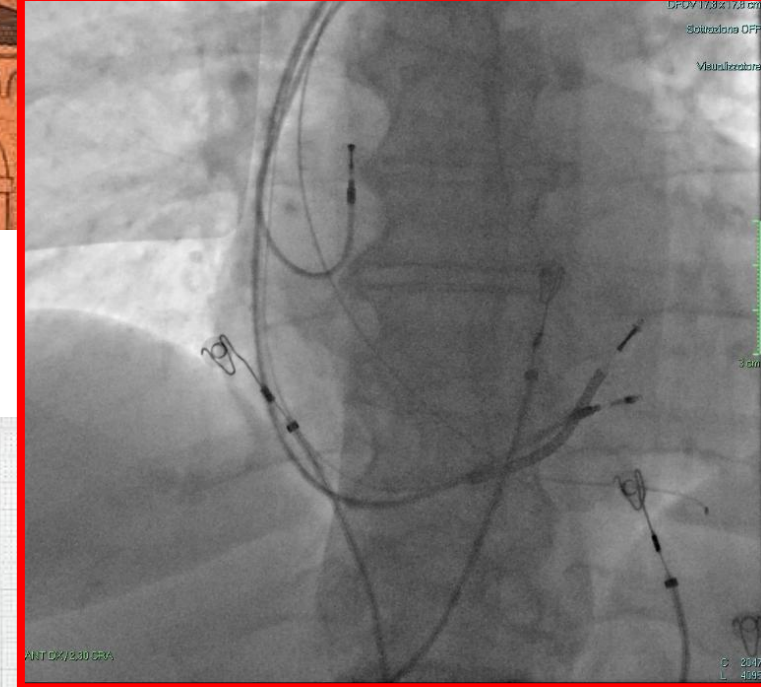
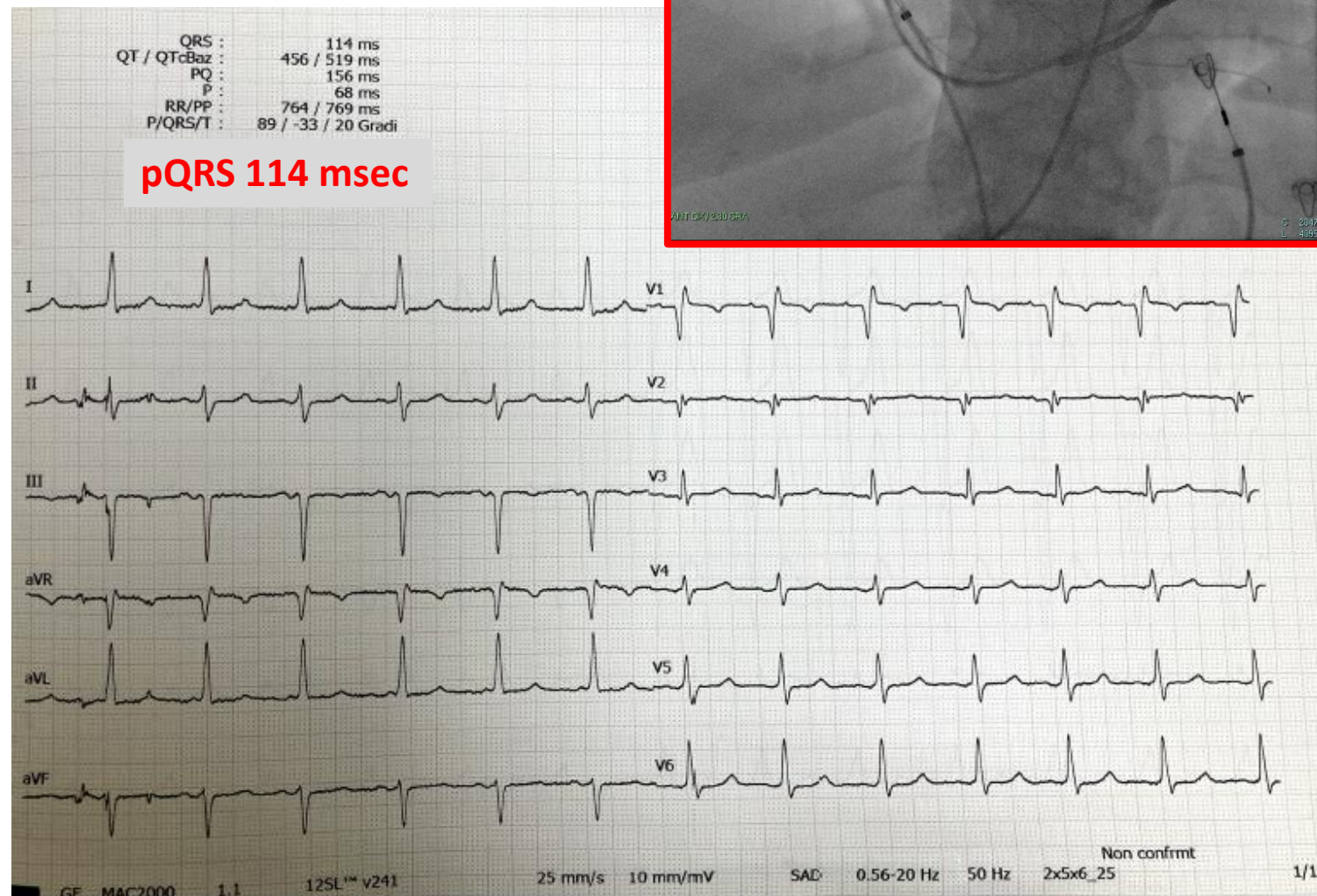
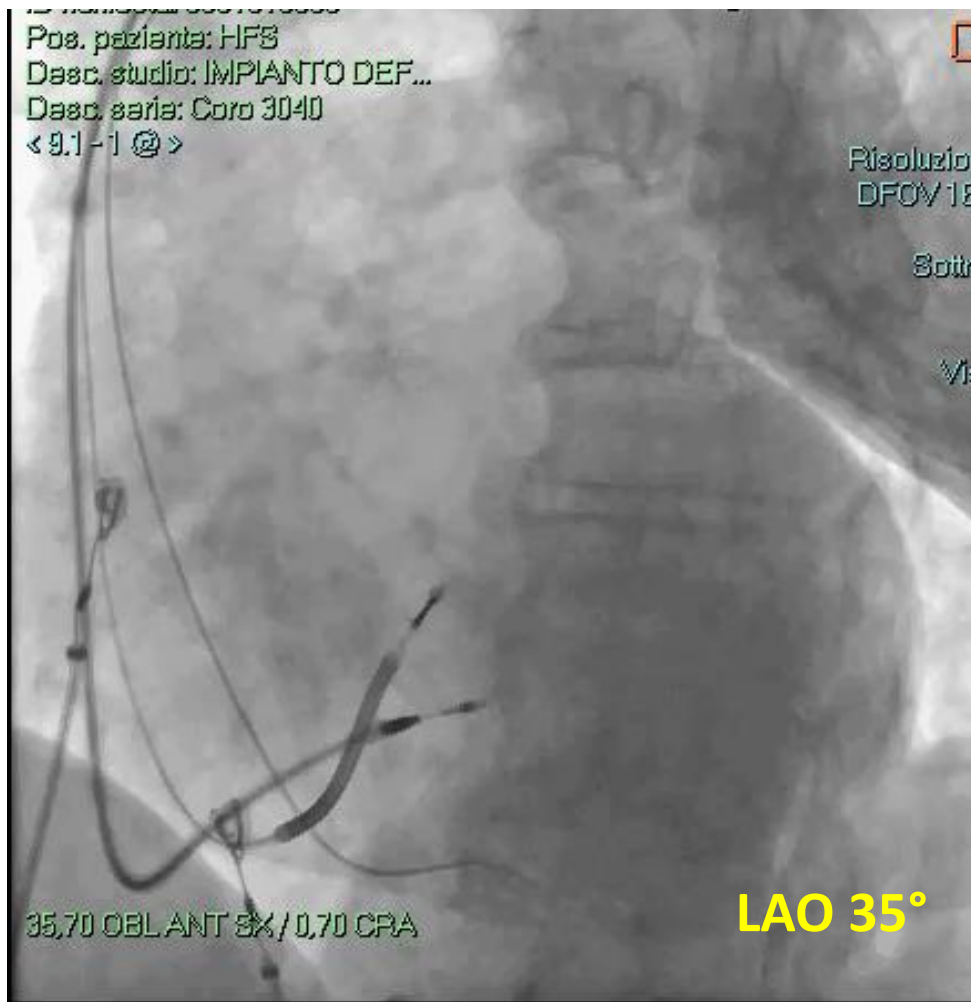
BIELLA CUORE

12-13 SETTEMBRE 2025



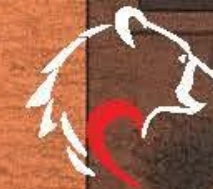
BIELLA CUORE

12-13 SETTEMBRE 2025



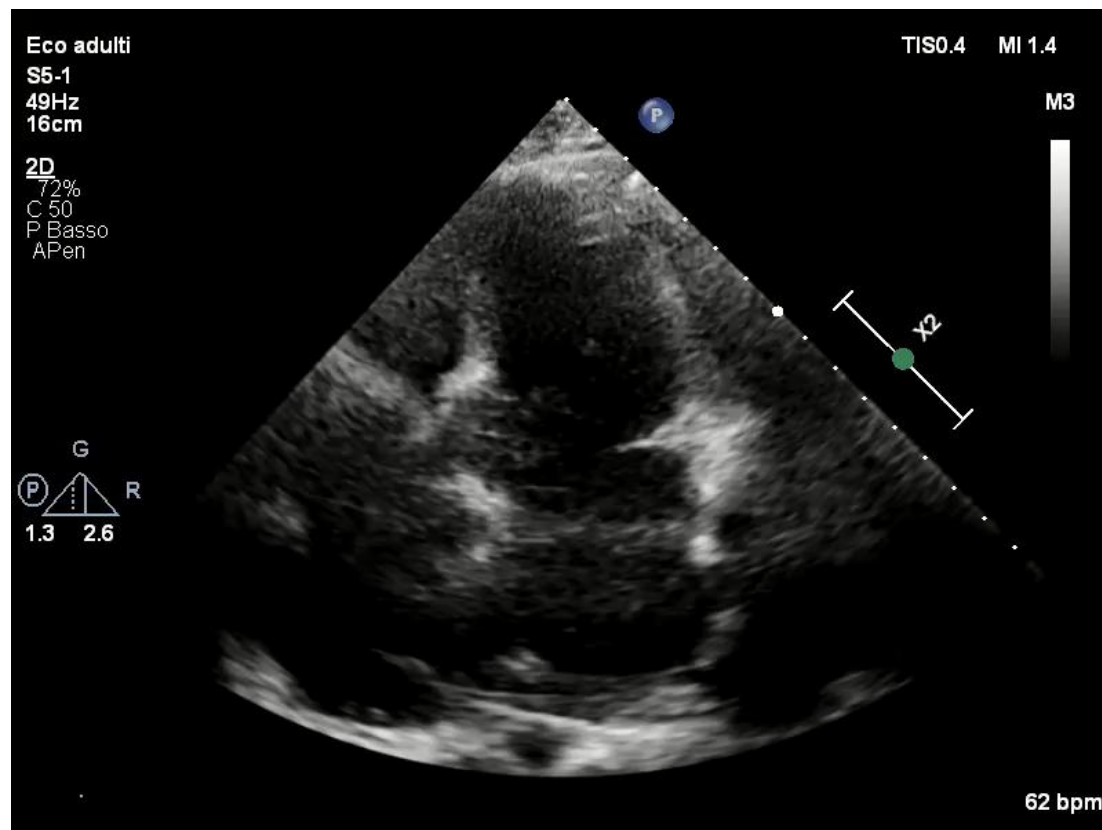
BIELLA CUORE

12-13 SETTEMBRE 2025



FOLLOW UP, 1 ANNO

- Soglia LBBAP 0,5 V@0,4 msec, Vp 100%
- CF NYHA I
- FE 55%, VSx normalizzato, IM lieve



VTD 90 ml

PAPs 30 mmHg



Caso 2: LESS IS ~~MORE~~ *less*

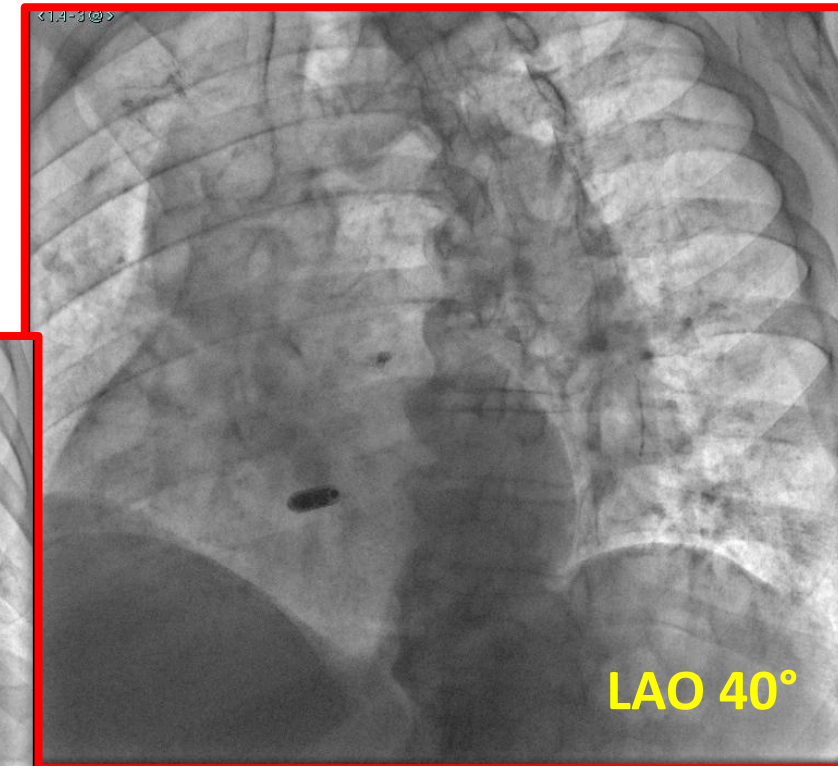
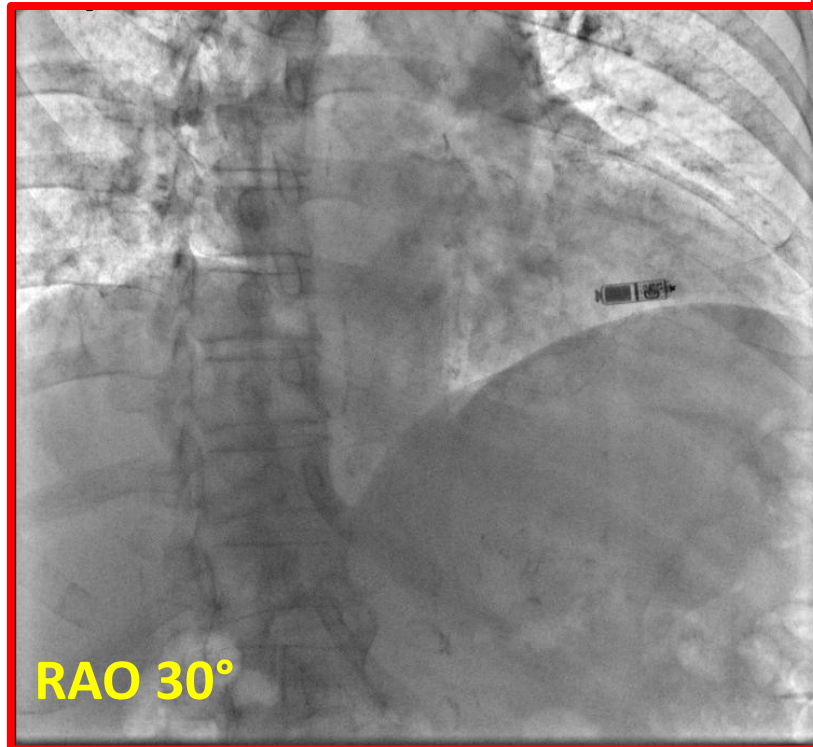
M, 82 aa

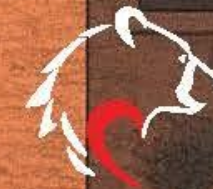
Diabete mellito, CAD trivasale pregresse PCI,
arteriopatia periferica severa

11/2021: lobectomia polmonare sup. dx (K)
+ linfadenectomia ilomediastinica

Post intervento BAV totale >>

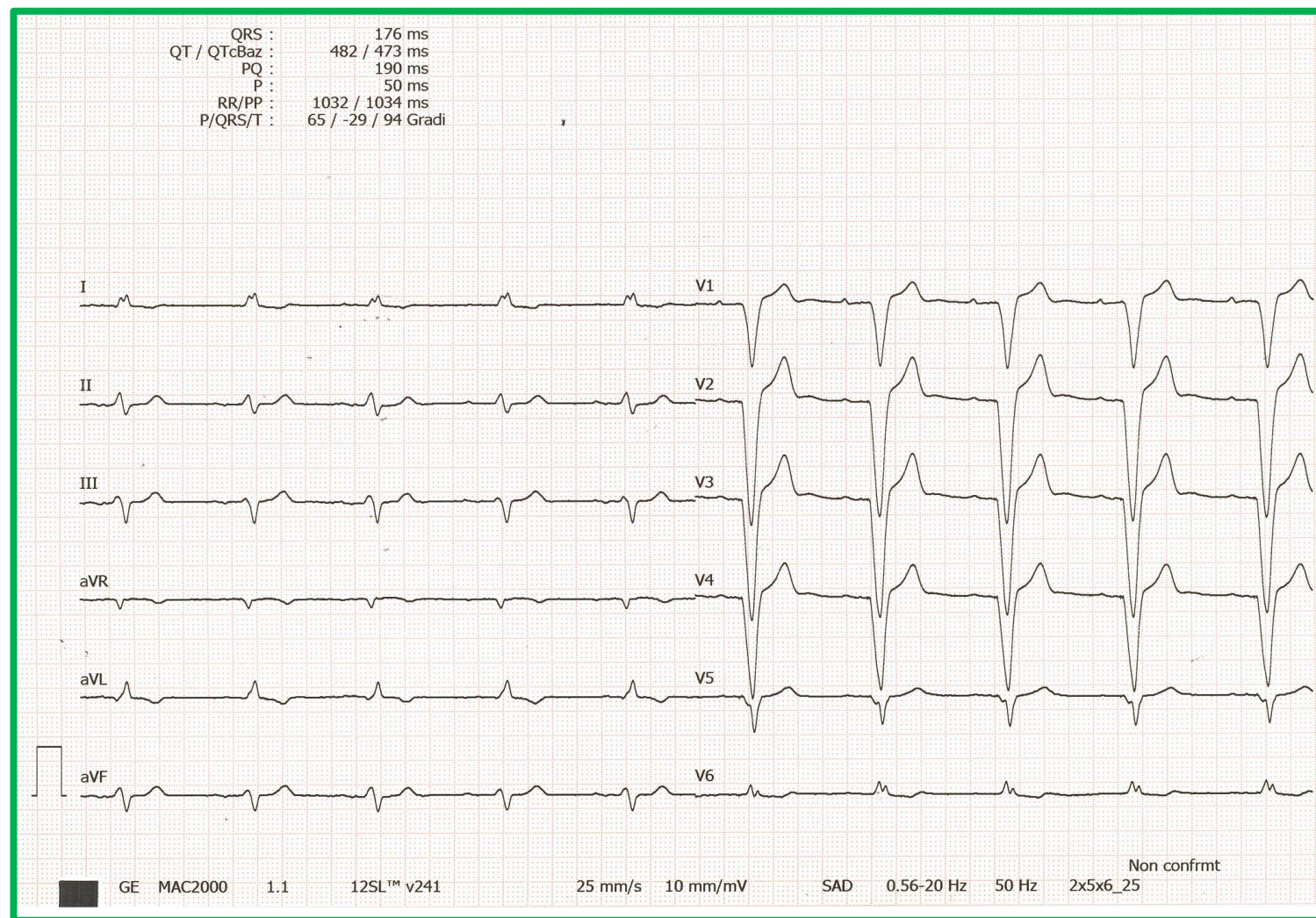
>> **impianto PM leadless AV (VDD)**





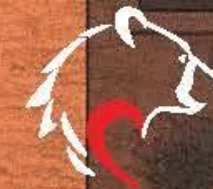
11/2024 controllo PM leadless AV

- Vp 100% (stimolazione ASINCRONA A-V 20%)
- Soglia elevata: 1,88 V @0,4 msec
- ERI precoce: batteria 2,78 V, durata residua stimata 6 mesi
- pQRS 176 msec



BIELLA CUORE

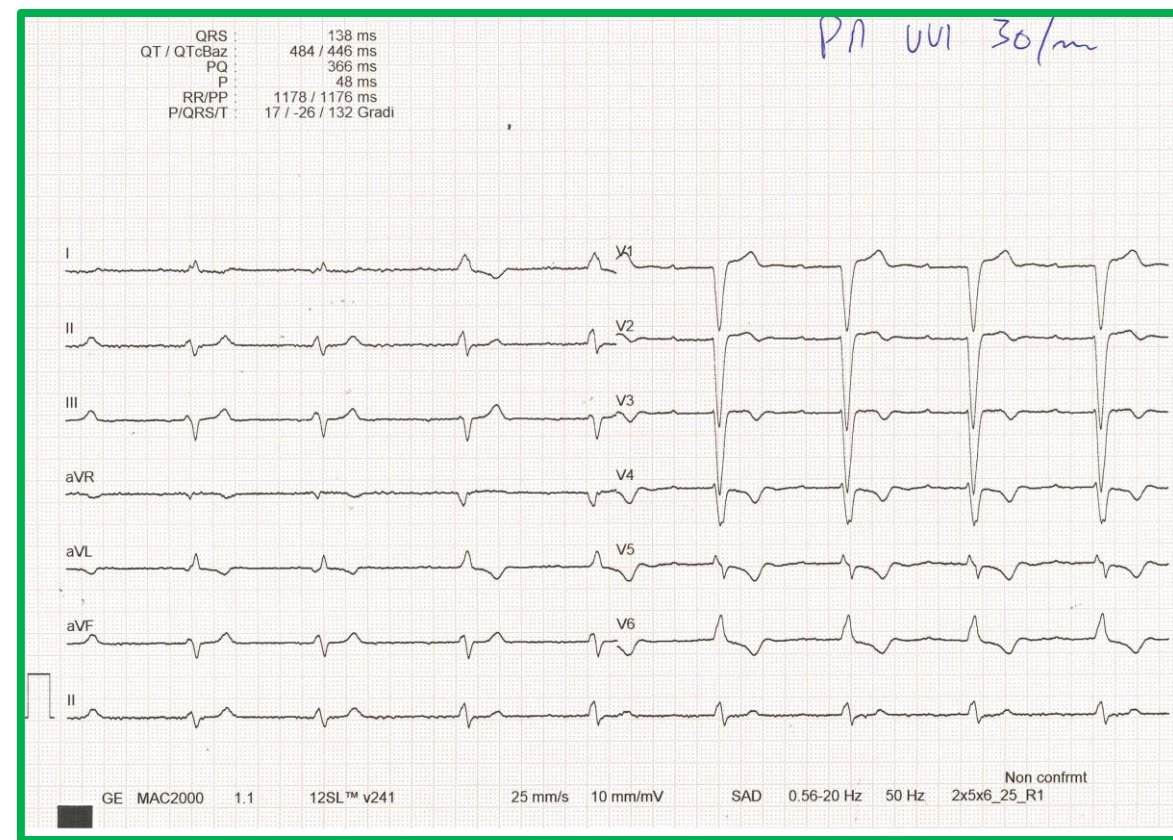
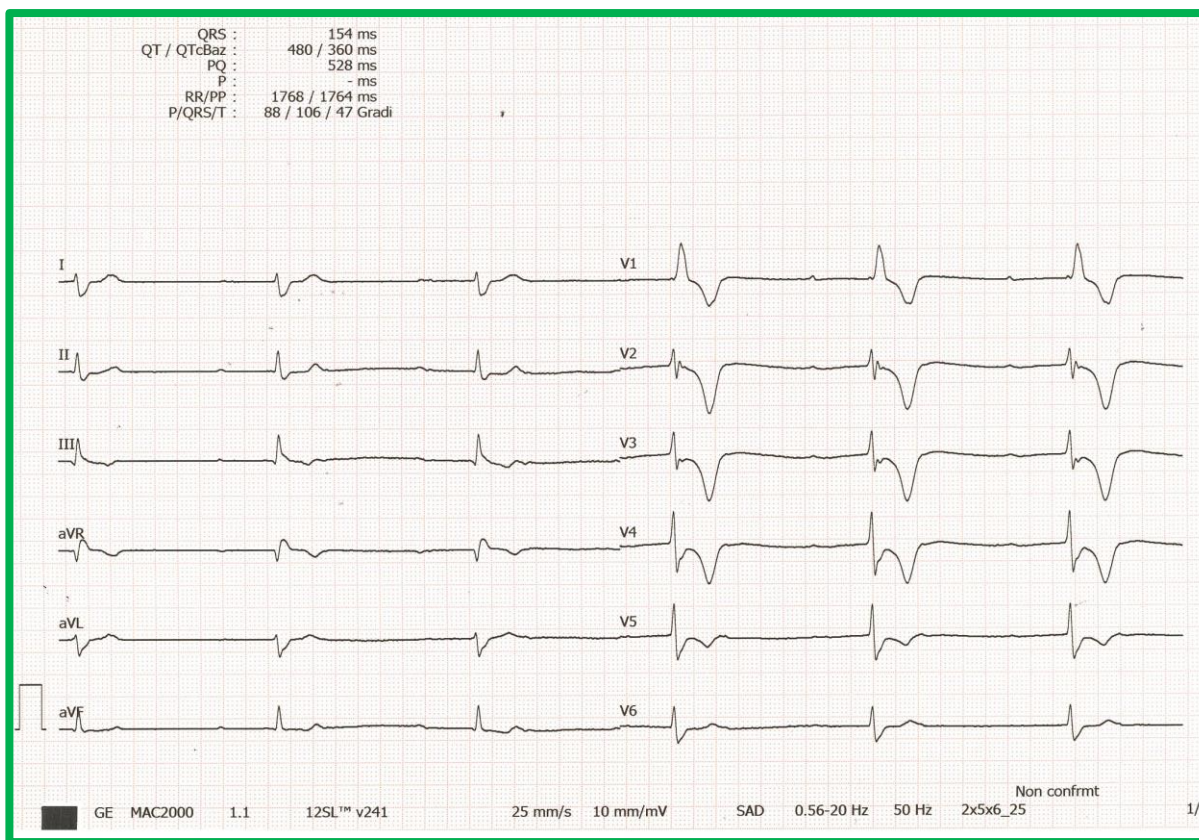
12-13 SETTEMBRE 2025



11/2024 controllo PM leadless AV

PM VVI 30/min:

- BAV totale, BBDx (sQRS 150 msec)
- BAV I grado (PQ 400 msec) + BBSx (sQRS 140 msec)



BIELLA CUORE

12-13 SETTEMBRE 2025



- FE 50%, discinesia settale, ipertrofia settale. IM lieve
- Riduzione classe funzionale (+++ da sforzo, dissincronia AV?)
- BAV totale, pQRS 170 msec, sQRS 150 msec

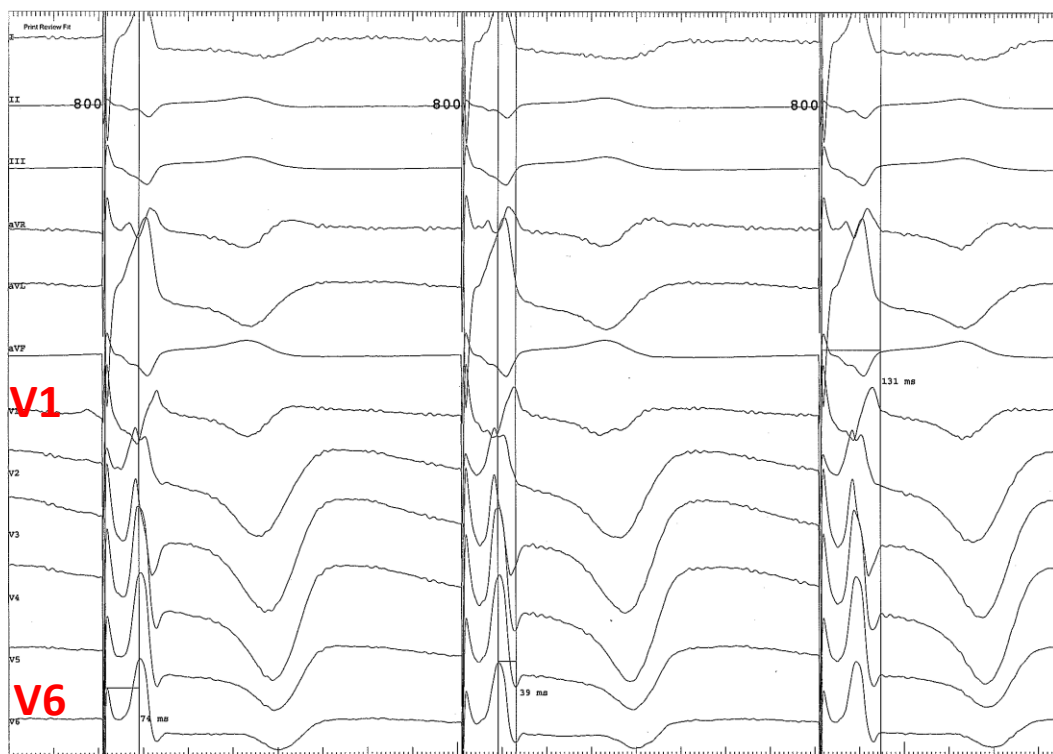
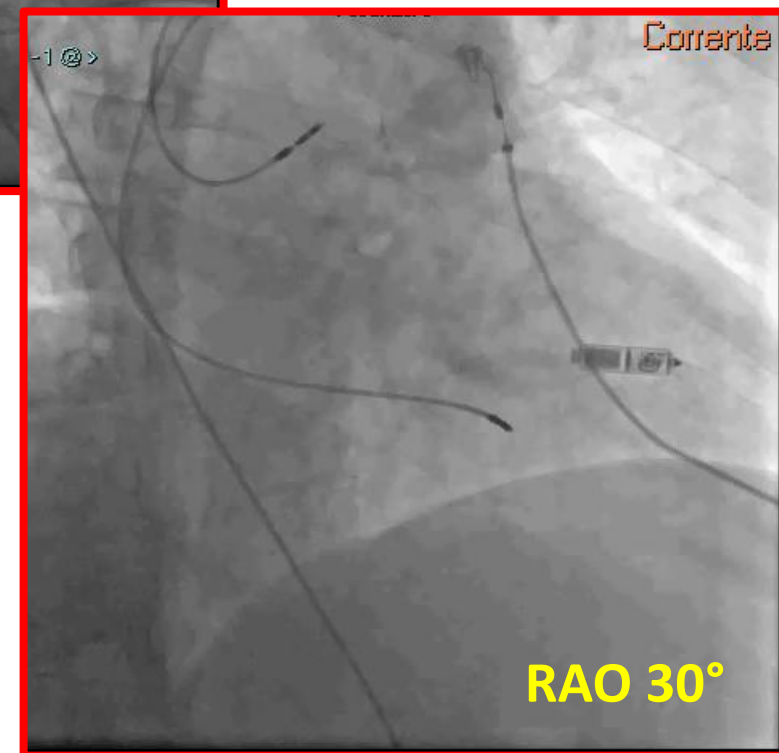
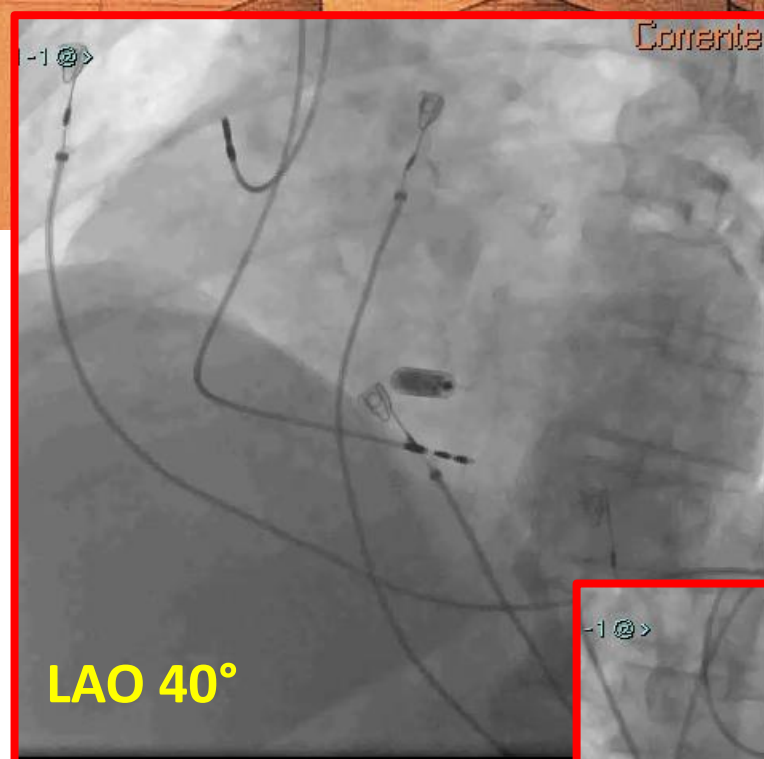
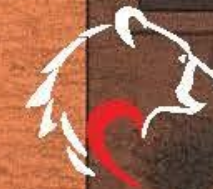
→ upgrade PM DDD (LBBAP)

BIELLA CUORE

12-13 SETTEMBRE 2025

- FE 50%, discinesia settale, ipertrofia settale. IM lieve
- Riduzione classe funzionale (+++ da sforzo, dissincronia AV?)
- BAV totale, pQRS 170 msec, sQRS 150 msec

→ upgrade PM DDD (LBBAP)

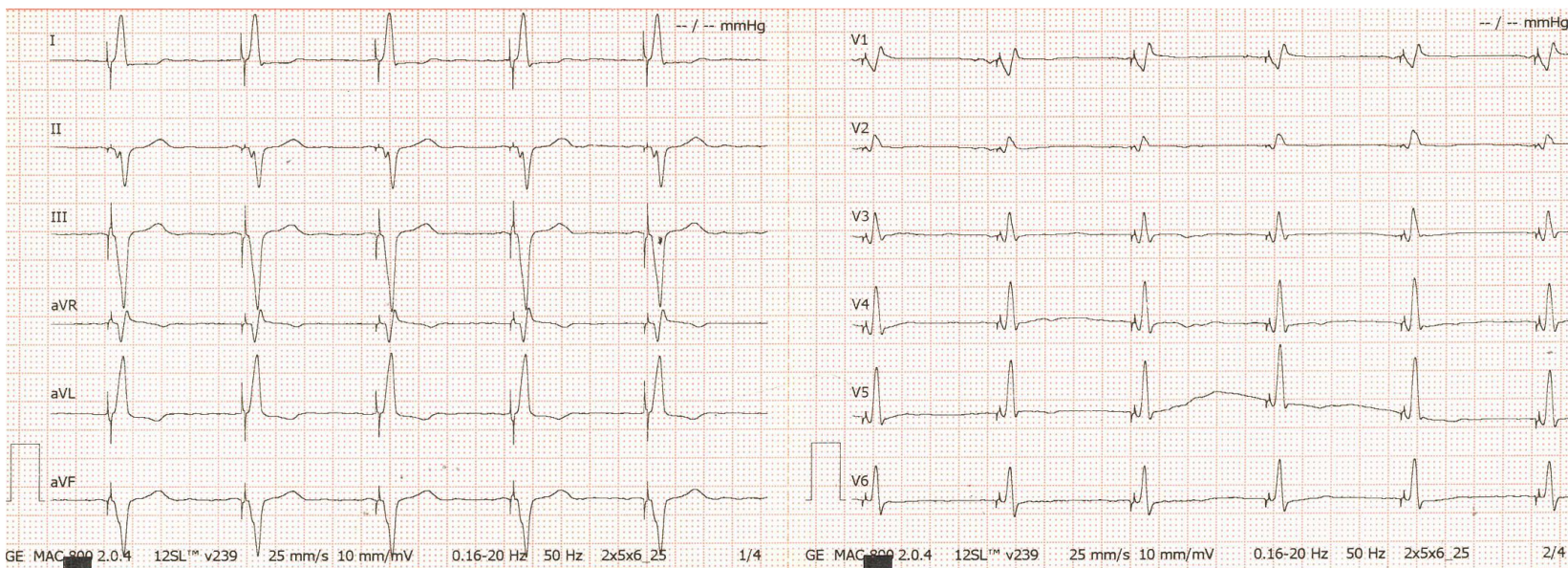


LVAT 74 ms; RV6-RV1 40 ms; pQRS 130 ms



FOLLOW UP, 3 MESI

- Miglioramento classe funzionale
- Ap 19% Vp 100% (DDD 60/min)
- Soglia V 0,5 V @0,5 msec
- pQRS 120 msec



Advice: upgrade to CSP

Strength of evidence

Advice TO DO

It is advised that patients should be assessed regularly and particularly prior to elective generator replacement for need for device upgrade. Considerations include: pacing percentage, symptoms, LVEF, BNP, risk of infection, and patient frailty^{230,231}



>90% agree

May be appropriate TO DO

In patients with PICM, it may be appropriate to upgrade to CSP to improve HF symptoms and LVEF^{129,230,233-239} particularly in patients with an intact His-Purkinje system^a (where CSP is likely to deliver synchronous activation).^{129,230,233-239}

When upgrading to CSP, it may be appropriate to incorporate all pacing leads into the pacing system rather than abandoning the existing ventricular lead, as it enables backup pacing and facilitates MRI-conditionality



>90% agree

Caso 3: RALLENTA, JOHNNY!



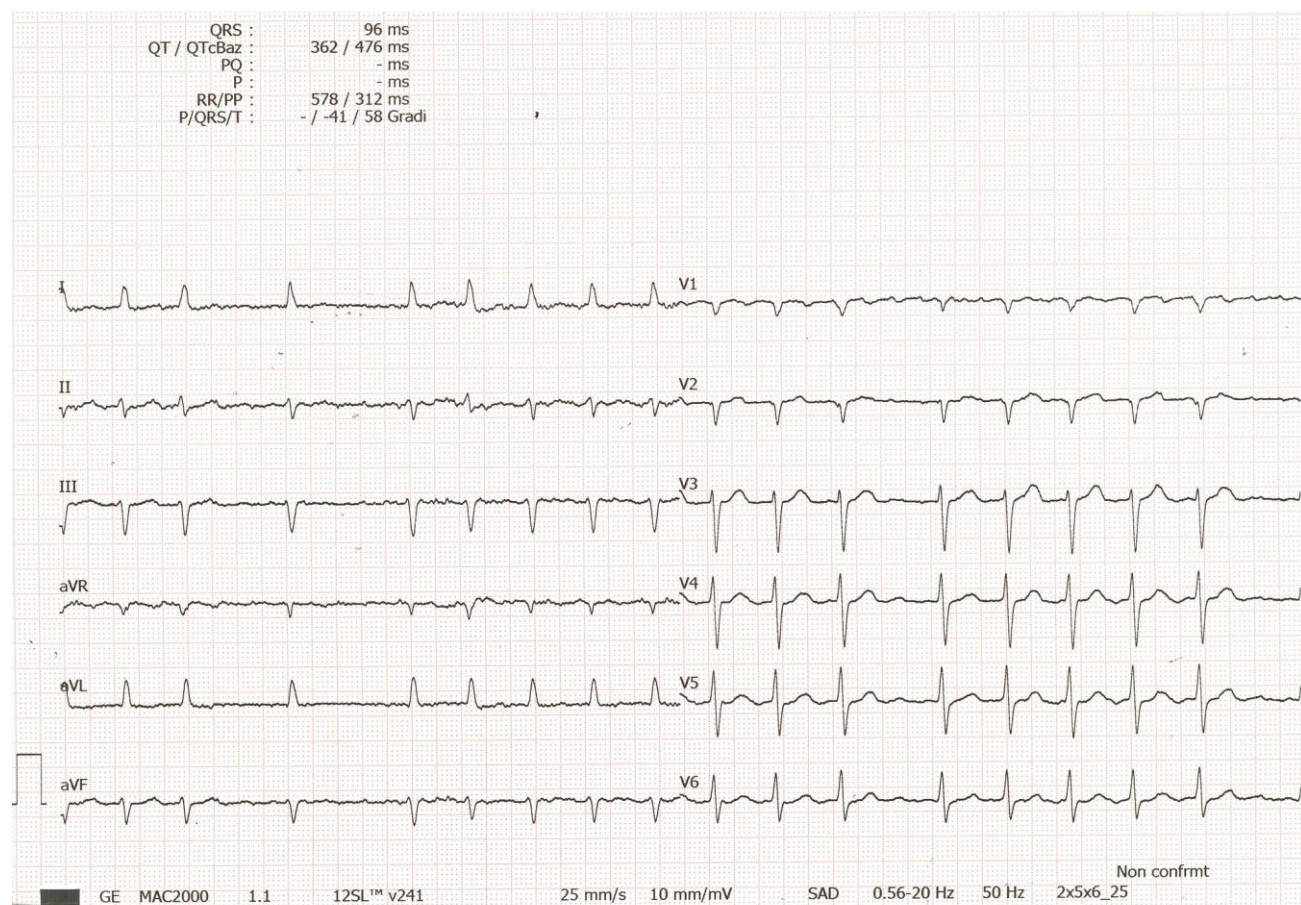
M, 75 aa

- **FA parossistica/persistente recidivante**, pregresse ablazioni complesse con RF (totale n.3)
- **Pregressa tachicardiomiopatia** (FE 40%), coronarie epicardiche indenni
- **Intolleranza/eventi avversi a farmaci antiaritmici** (amiodarone, flecainide, sotalolo)

Frequenti episodi di FA persistente ad alta fvm, **fortemente sintomatici**, pur in tp cronotropa massimale tollerata

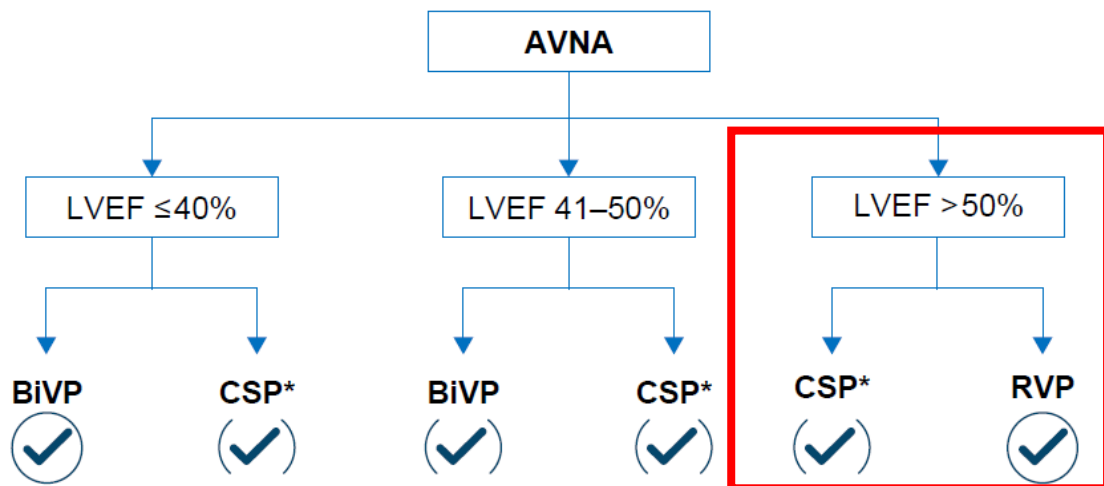
ECOCARDIO:

FE VSx 55%, VSx normali dimensioni e spessori, Asx dilatato



BIELLA CUORE

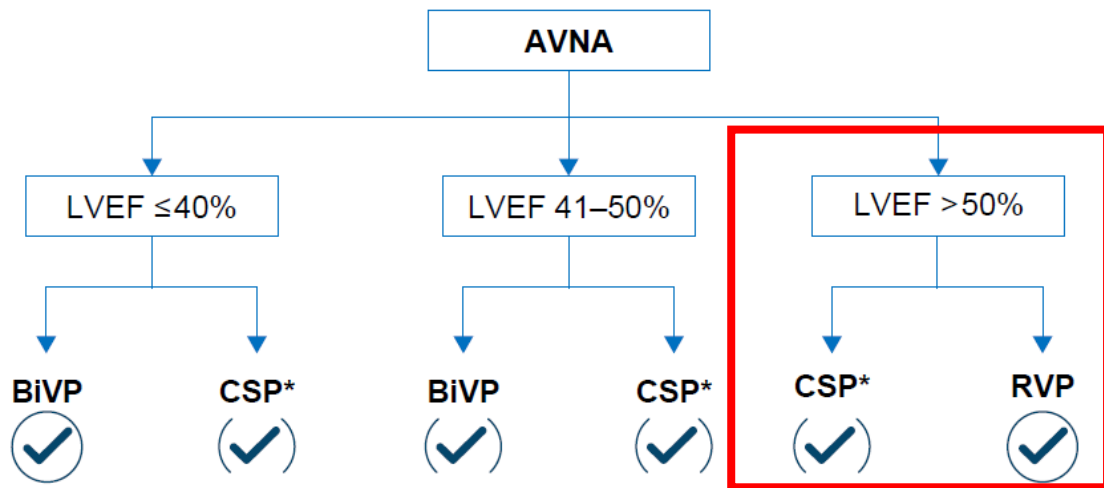
12-13 SETTEMBRE 2025



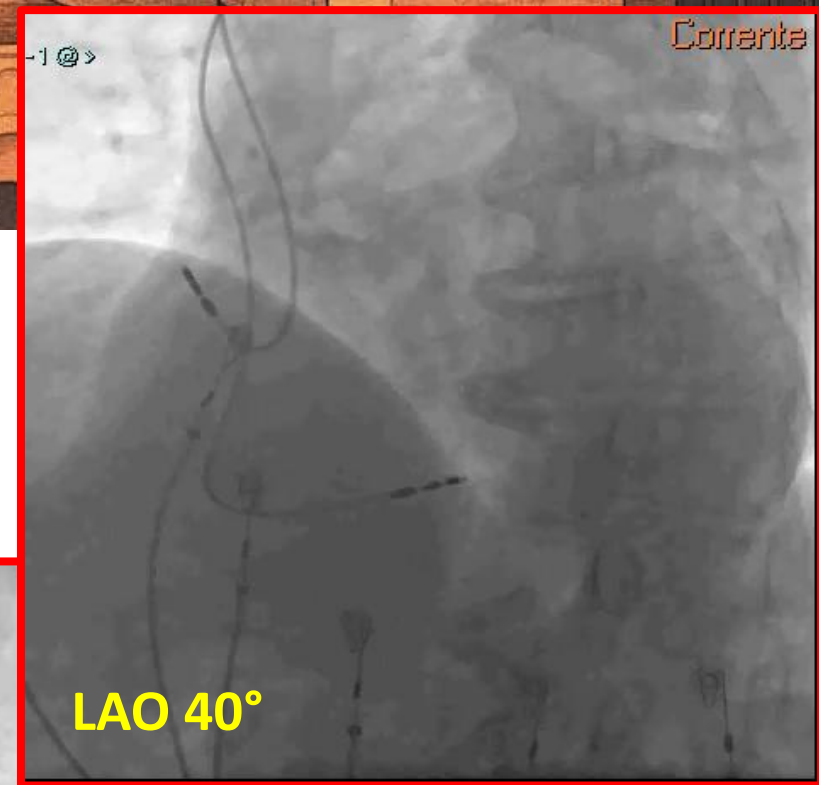
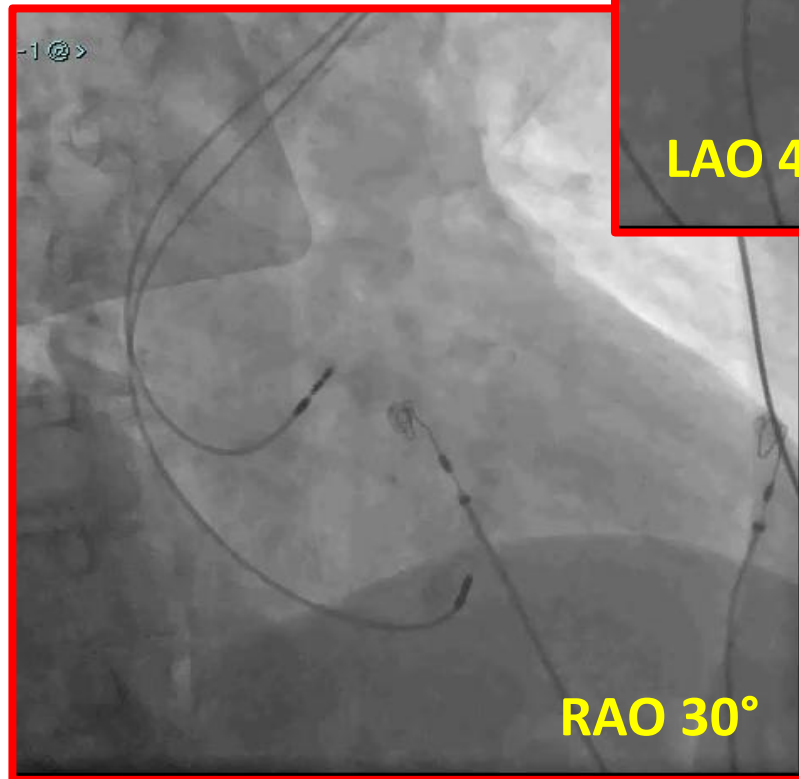
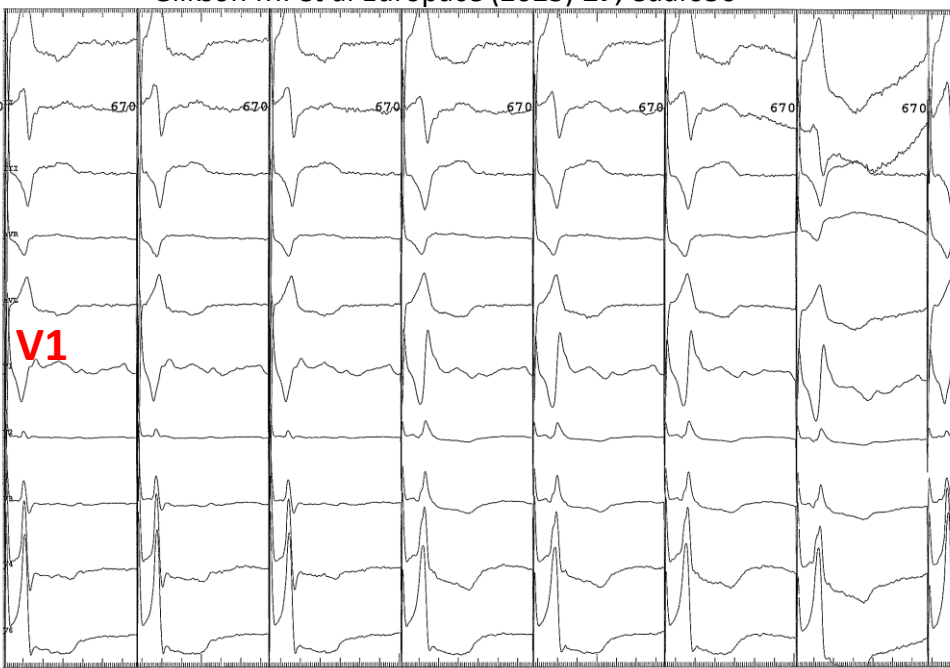
Glikson M. et al Europace (2025) **27**, euaf050

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12-13 SETTEMBRE 2025



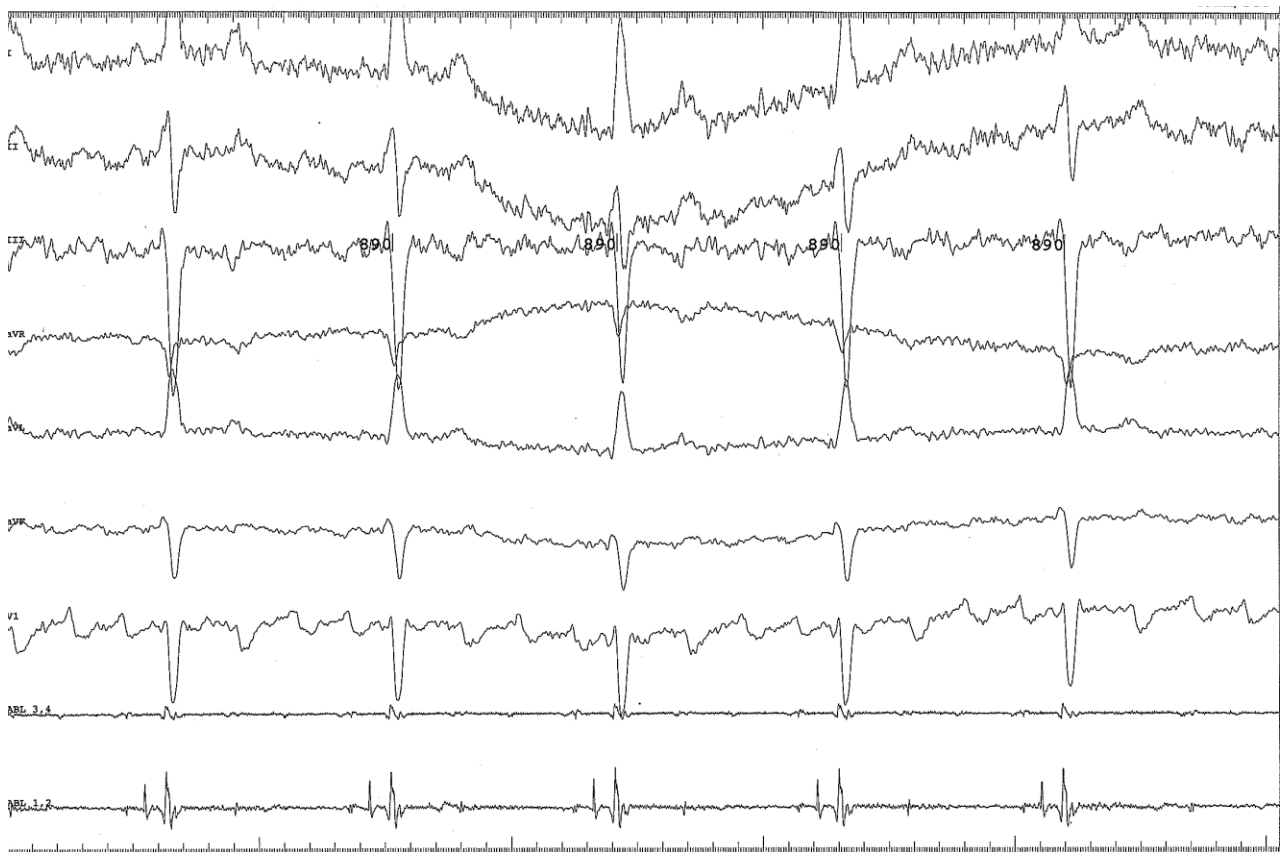
Glikson M. et al Europace (2025) 27, euaf050



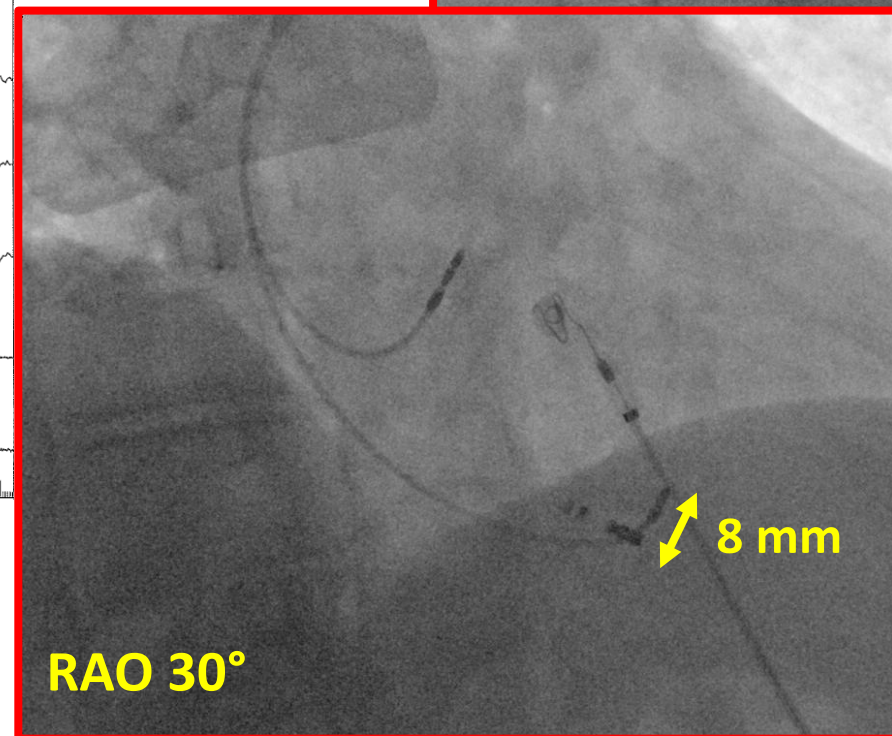
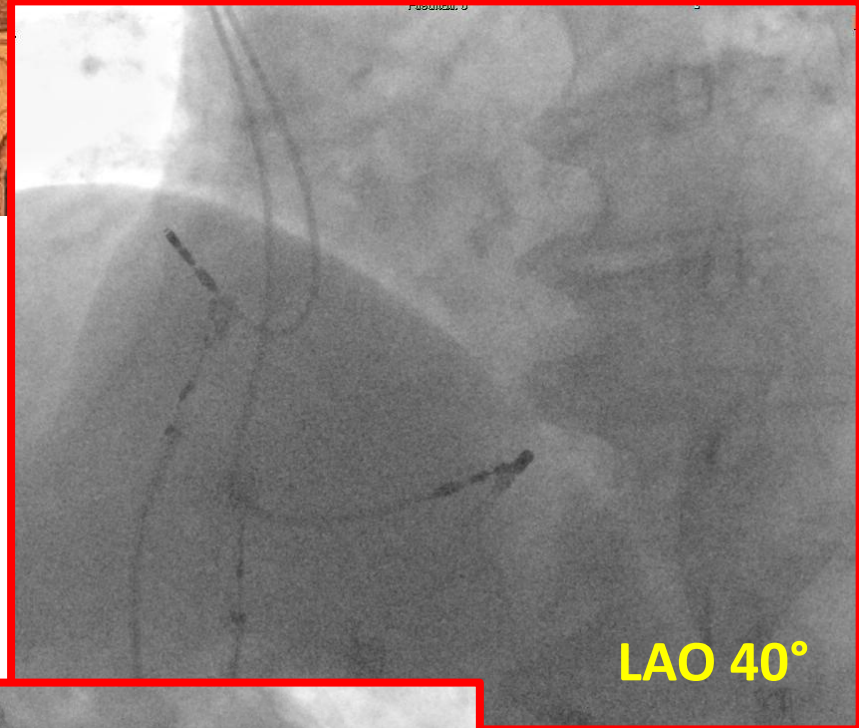
Soglia 0,6 V @0,5 msec UNI

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12-13 SETTEMBRE 2025



35 Watt, 45 secondi



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12-13 SETTEMBRE 2025

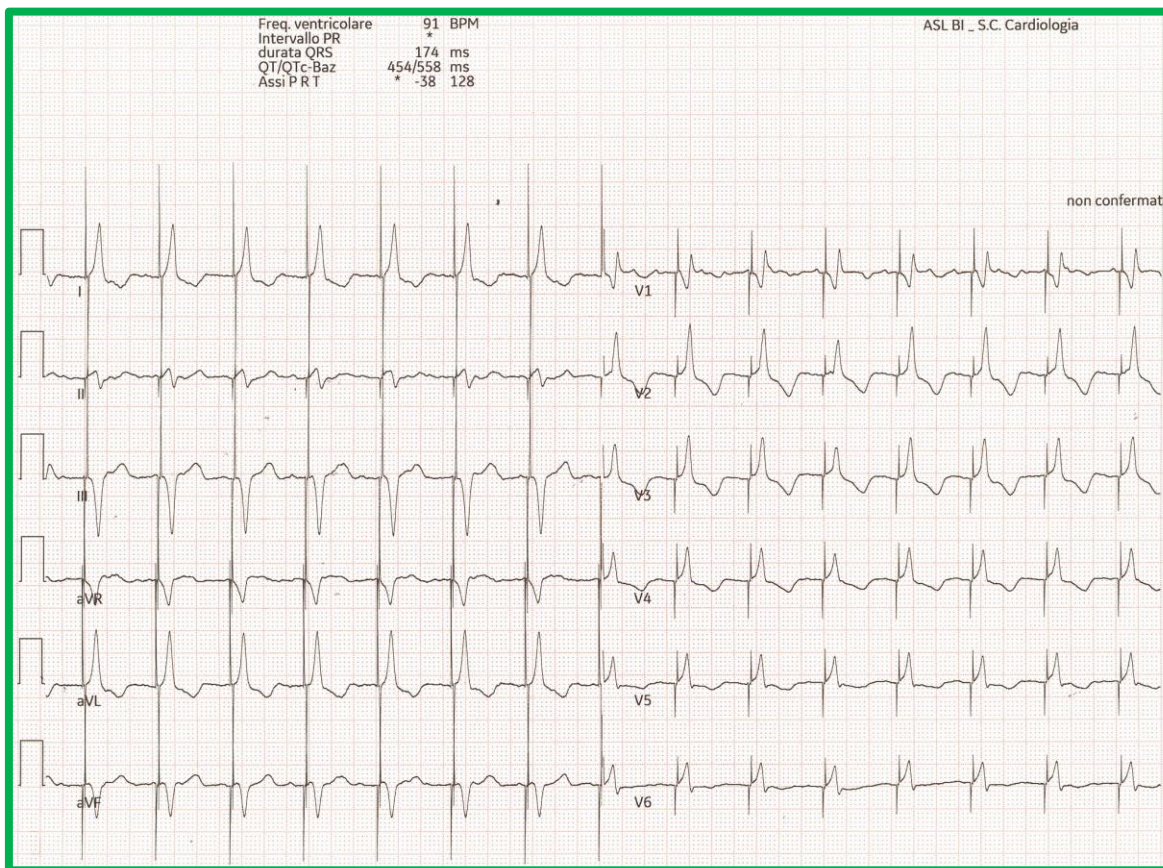


POST ABLAZIONE

Soglia in acuto: 3,6 V @1,5 msec, UNI

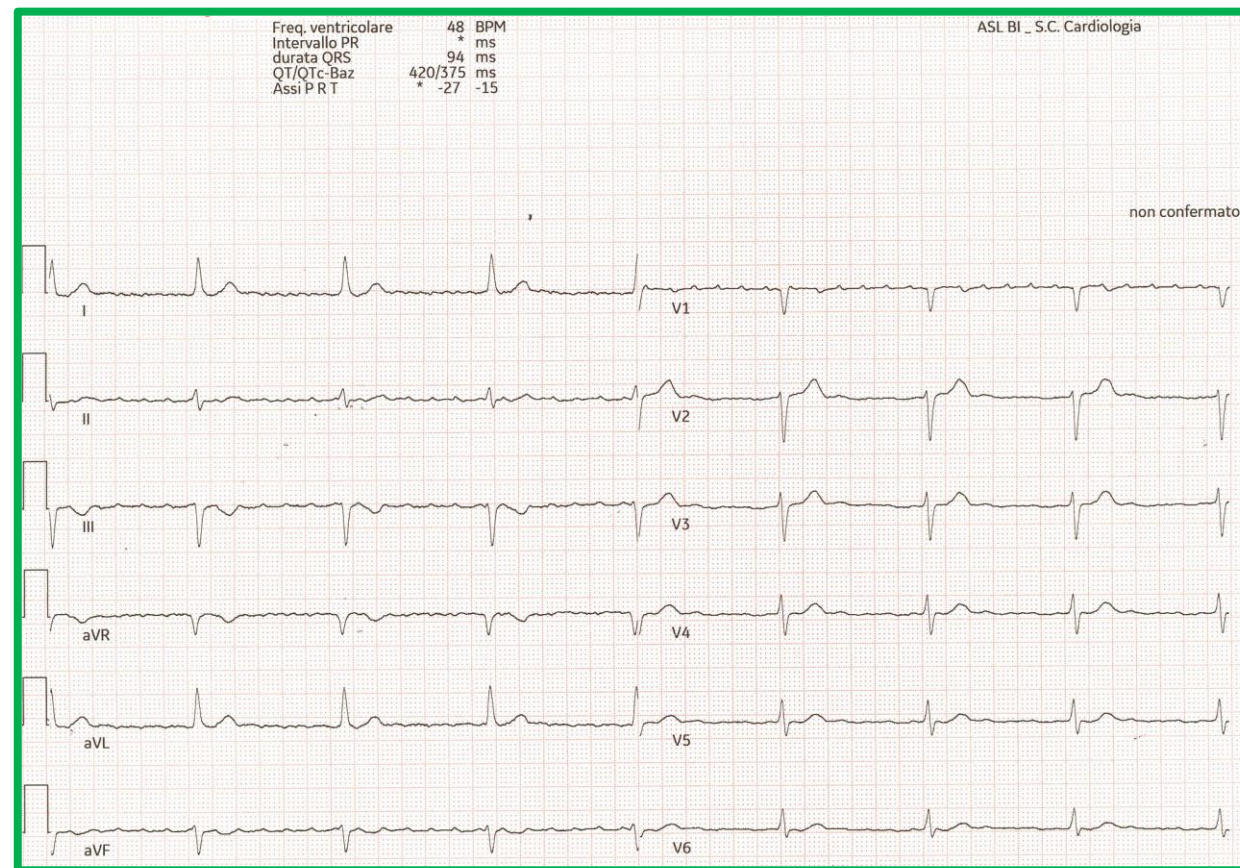
Impedenza 280 ohm UNI

Sensing 3,5 mV



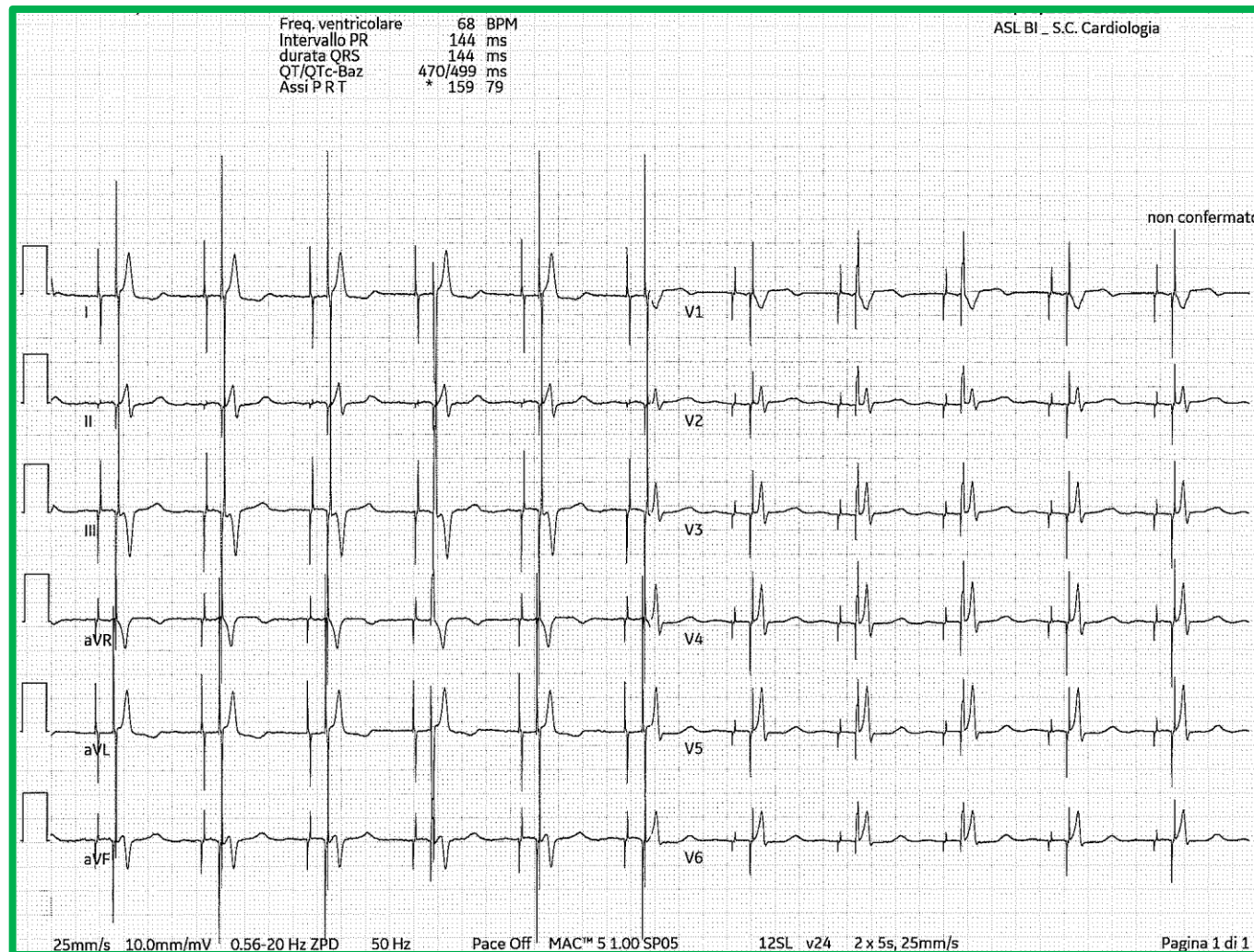
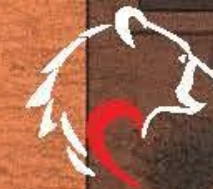
POST ABLAZIONE

Ritmo giunzionale stabile 48 bpm



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12-13 SETTEMBRE 2025

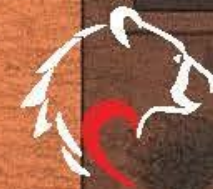


DIMISSIONE

- Soglia: 1,3 V @1 msec, UNI
- Impedenza 300 ohm UNI
- Sensing 6 mV
- Ripristino ritmo sinusale

BIELLA CUORE

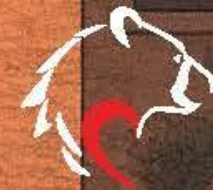
12-13 SETTEMBRE 2025



E tutti vissero felici e contenti!



BIELLA CUORE
12-13 SETTEMBRE 2025



LBBAP: esperienze di real life

Dr. E. Boggio

