“ Catheter ablation of VT in patients with a structural heart disease “

(Електрофизиологија на срце, процедури и техники)

ЈЗУ УК ЗА КАРДИОЛОГИЈА
“RONALD REAGAN MEDICAL CENTAR - UCLA , LOS ANGELES “ - АВГУСТ 2013Г.
ДР. ДЕЈАН РИСТЕСКИ

ДАТУМ НА ПРЕЗЕНТАЦИЈА:
02.10.2013Г.

Catheter ablation of VT in patients with a structural heart disease

D-R D.RISTESKI


RONALD REAGAN UCLA MEDICAL CENTER

-Cardiology unit-6 cath lab

-40 procedures: 10 VT ablations

9 Afib ablations

7 SVT ablations

4 WPW ablations

4 CRT implantations

3 ICD implantations

3 PM implantations

-Tuesday,Wednesday,Thursday morning lectures

EHRA / HRS

Expert Consensus on Catheter Ablation of Ventricular Arrhythmias

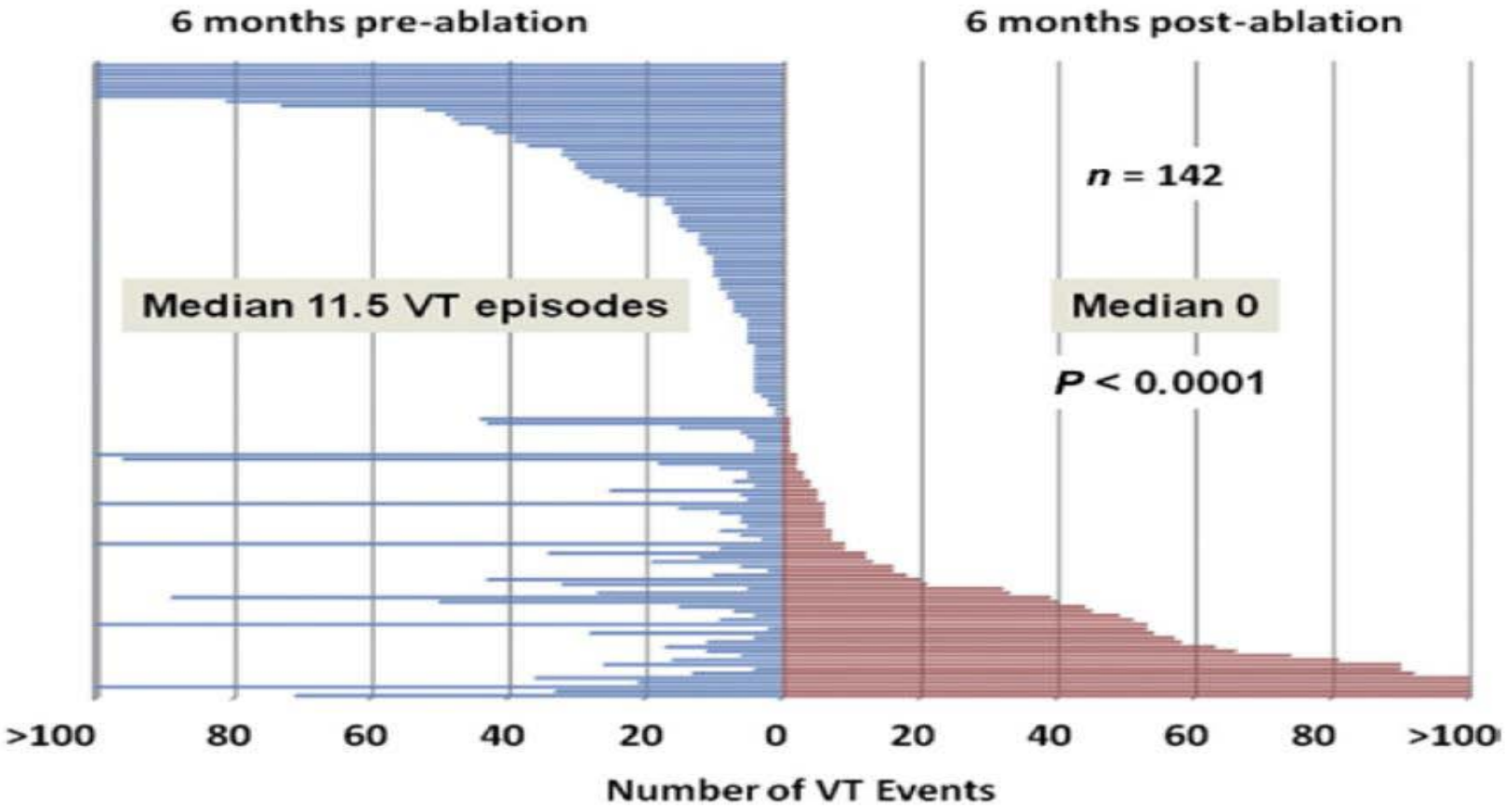
Patients with structural heart disease (including prior MI, dilated cardiomyopathy, ARVC/D)

Catheter ablation of VT is recommended

1. for symptomatic sustained monomorphic VT (SMVT), including VT terminated by an ICD, that recurs despite antiarrhythmic drug therapy or when antiarrhythmic drugs are not tolerated or not desired;*
2. for control of incessant SMVT or VT storm that is not due to a transient reversible cause;
3. for patients with frequent PVCs, NSVTs, or VT that is presumed to cause ventricular dysfunction;
4. for bundle branch reentrant or interfascicular VTs;
5. for recurrent sustained polymorphic VT and VF that is refractory to antiarrhythmic therapy when there is a suspected trigger that can be targeted for ablation.

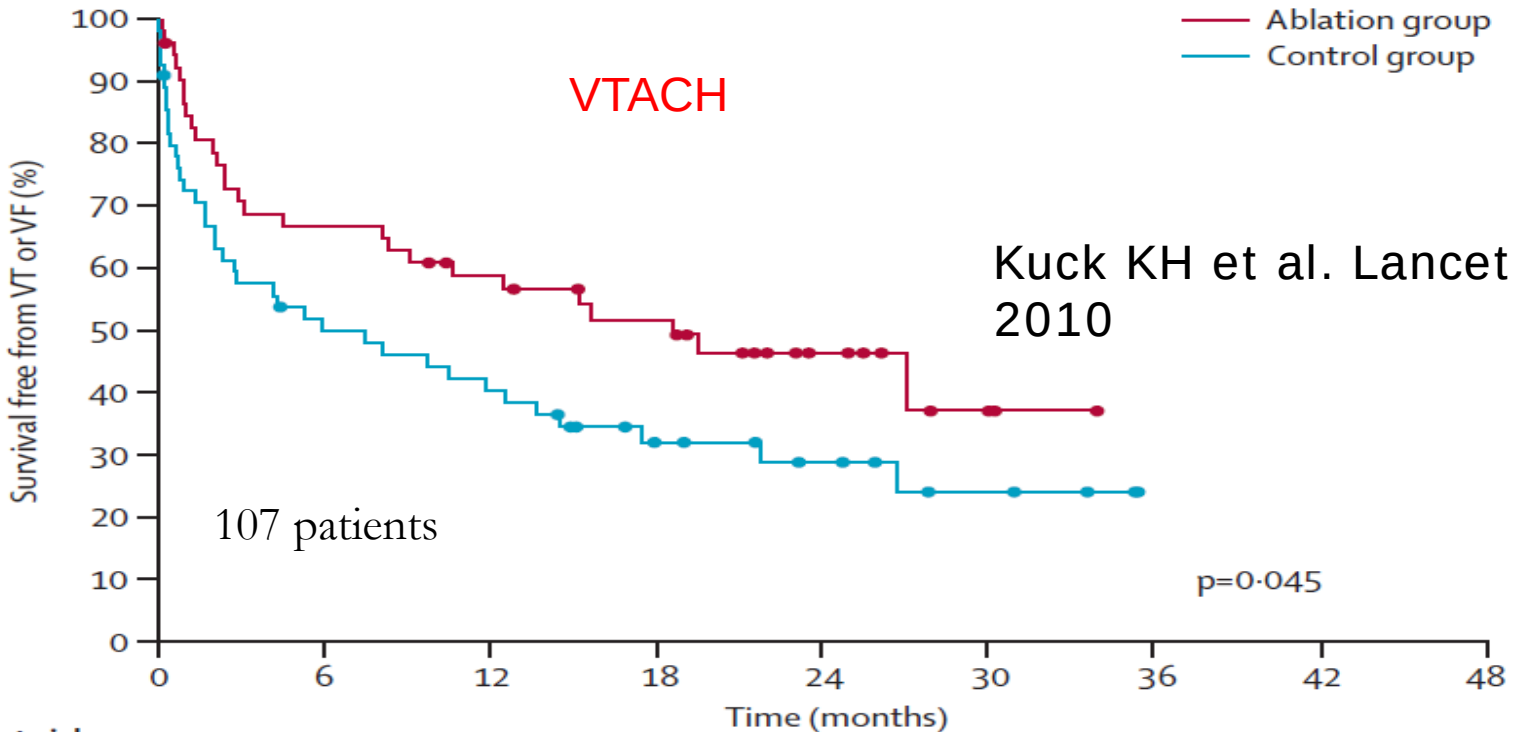
Catheter ablation should be considered

1. in patients who have one or more episodes of SMVT despite therapy with one of more Class I or III antiarrhythmic drugs;*
2. in patients with recurrent SMVT due to prior MI who have LV ejection fraction >0.30 and expectation for 1 year of survival, and is an acceptable alternative to amiodarone therapy;*
3. in patients with haemodynamically tolerated SMVT due to prior MI who have reasonably preserved LV ejection fraction (>0.35) even if they have not failed antiarrhythmic drug therapy.*



"There was consensus among the task force members that catheter ablation for VT should be considered early in the treatment of patients with recurrent VT"

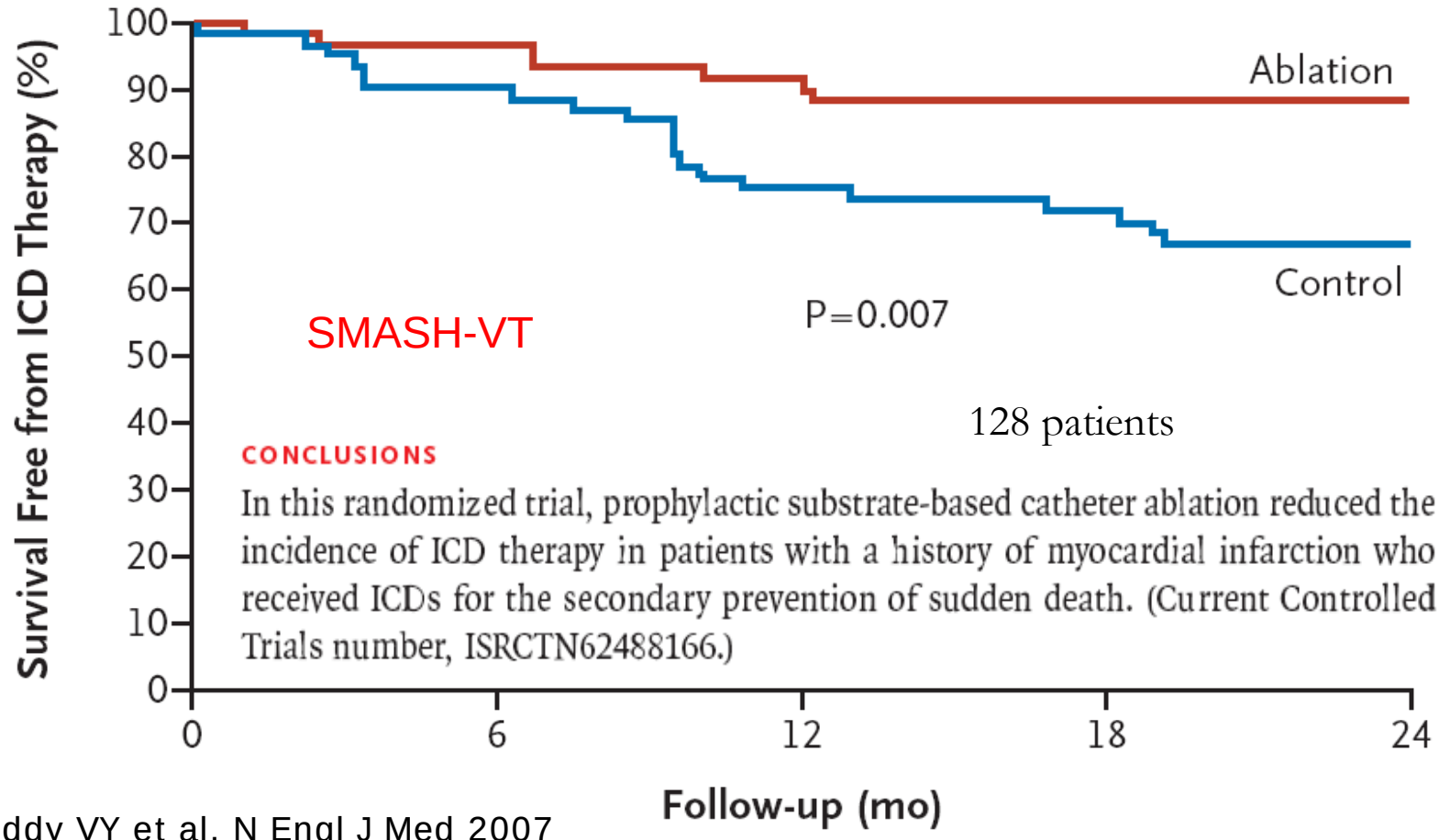
Ventricular Tachycardia Ablation in Coronary Heart Disease



Kuck KH et al. Lancet 2010

Interpretation Prophylactic VT ablation before defibrillator implantation seemed to prolong time to recurrence of VT in patients with stable VT, previous myocardial infarction, and reduced LVEF. Prophylactic catheter ablation should therefore be considered before implantation of a cardioverter defibrillator in such patients.

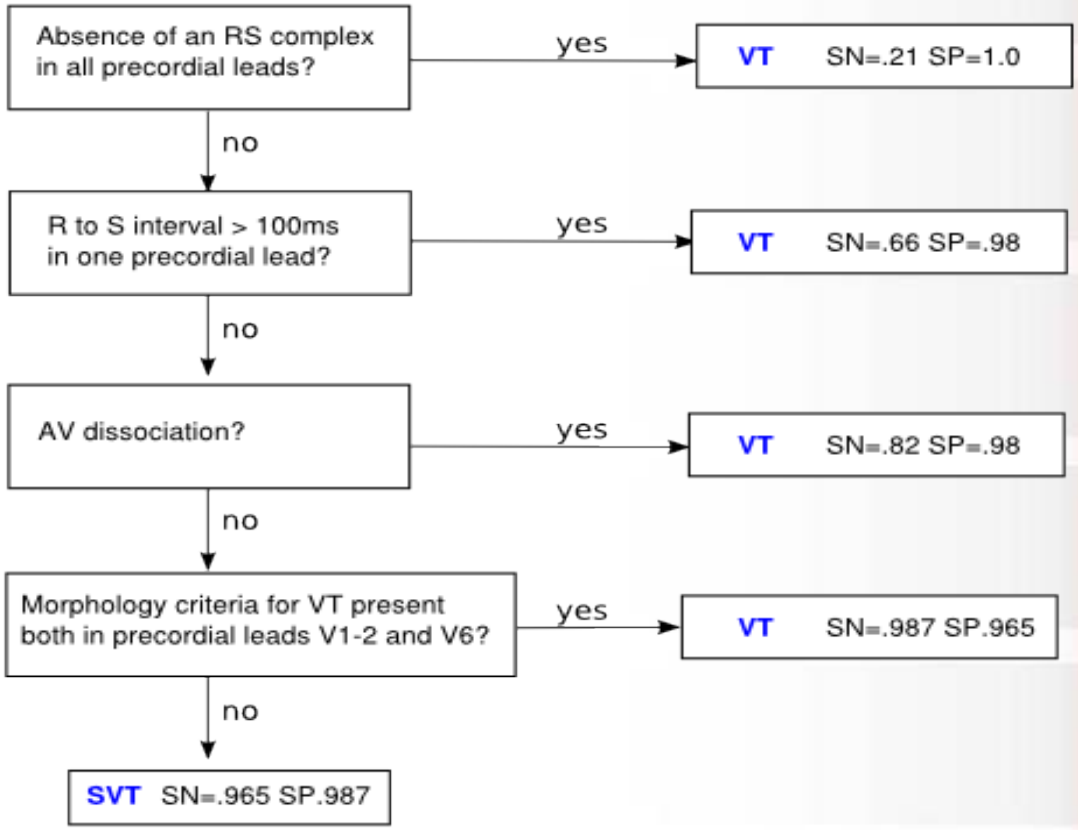
Substrate Mapping and Ablation in Sinus Rhythm to Halt Ventricular Tachycardia



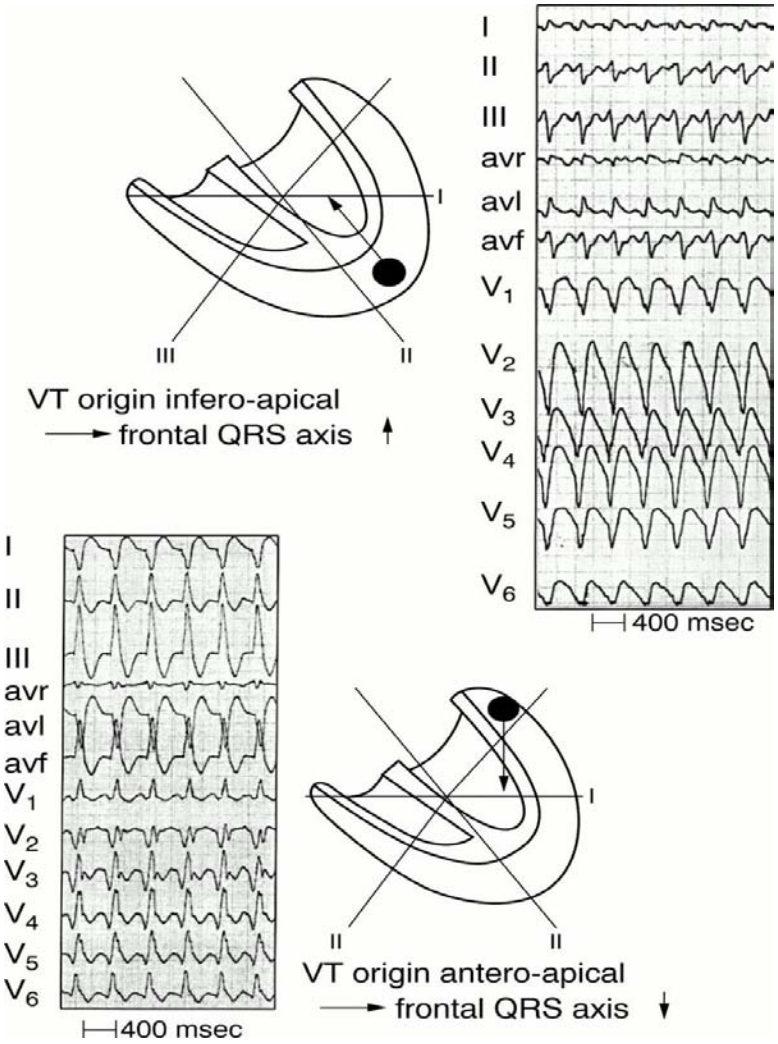
Reddy VY et al. N Engl J Med 2007

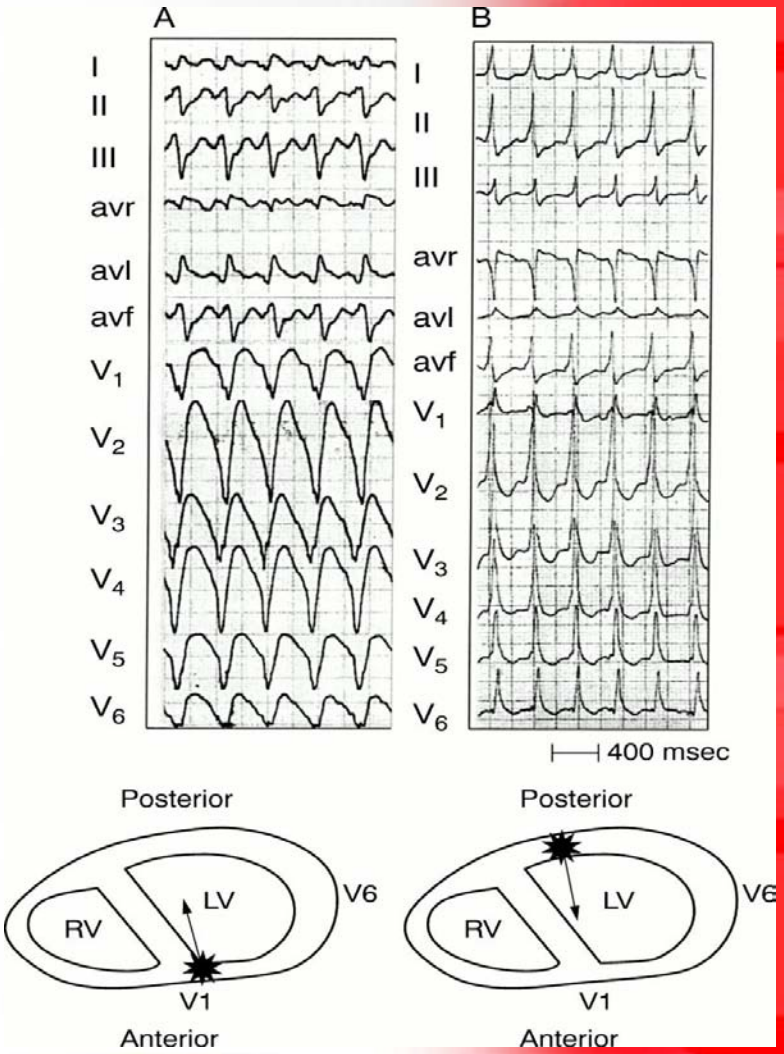
VT Diagnosis

Brugada Algorithm

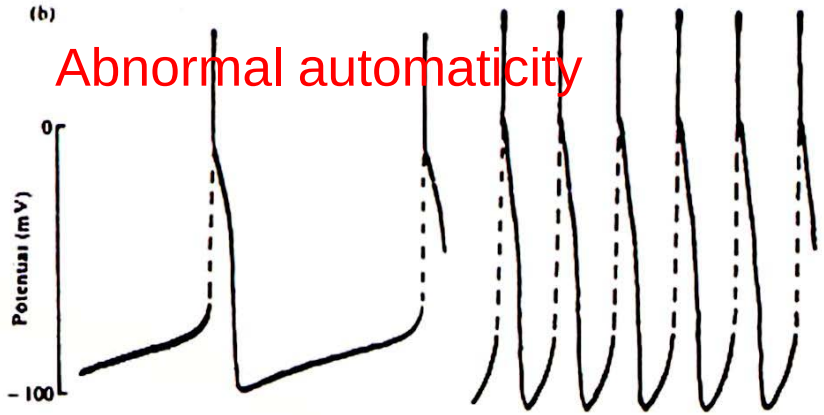


Principles to rapidly localize the VT exit site

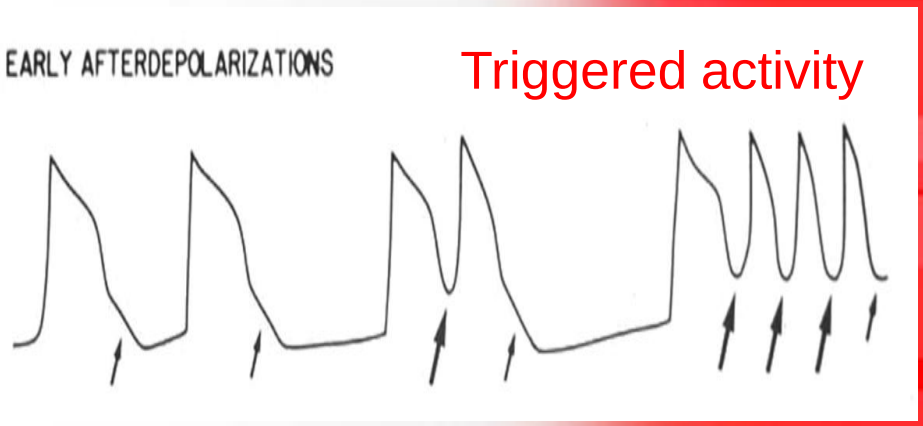




VT Mechanisms



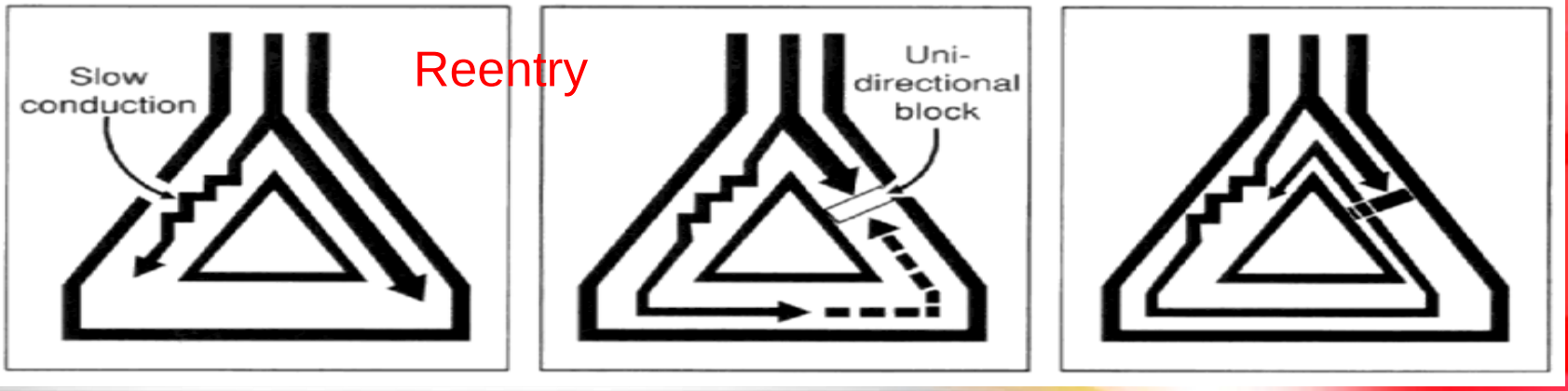
Abnormal automaticity

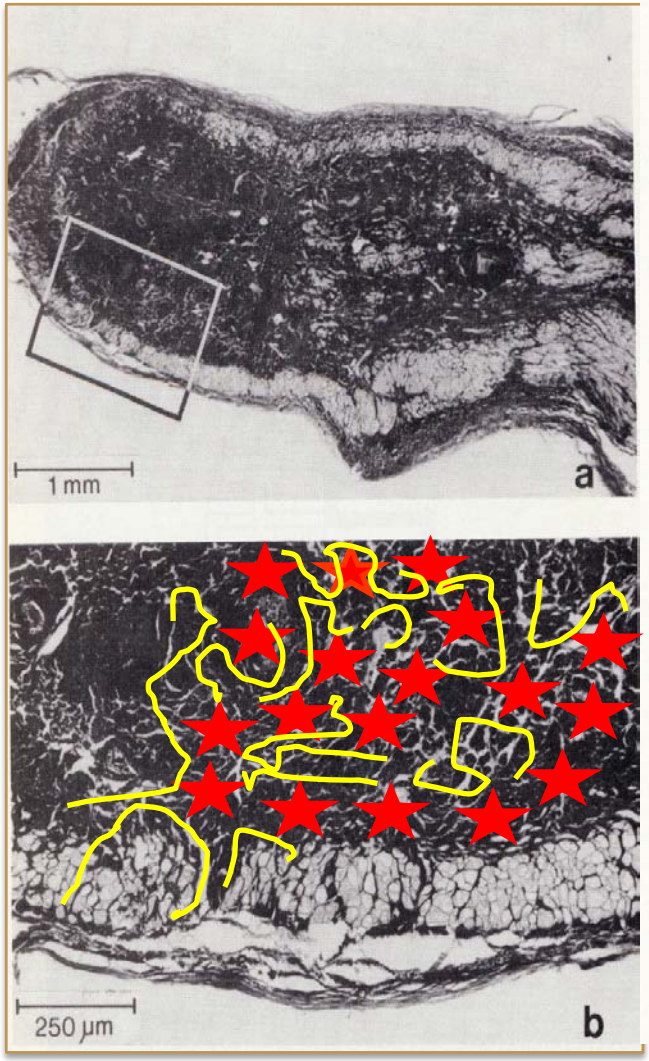


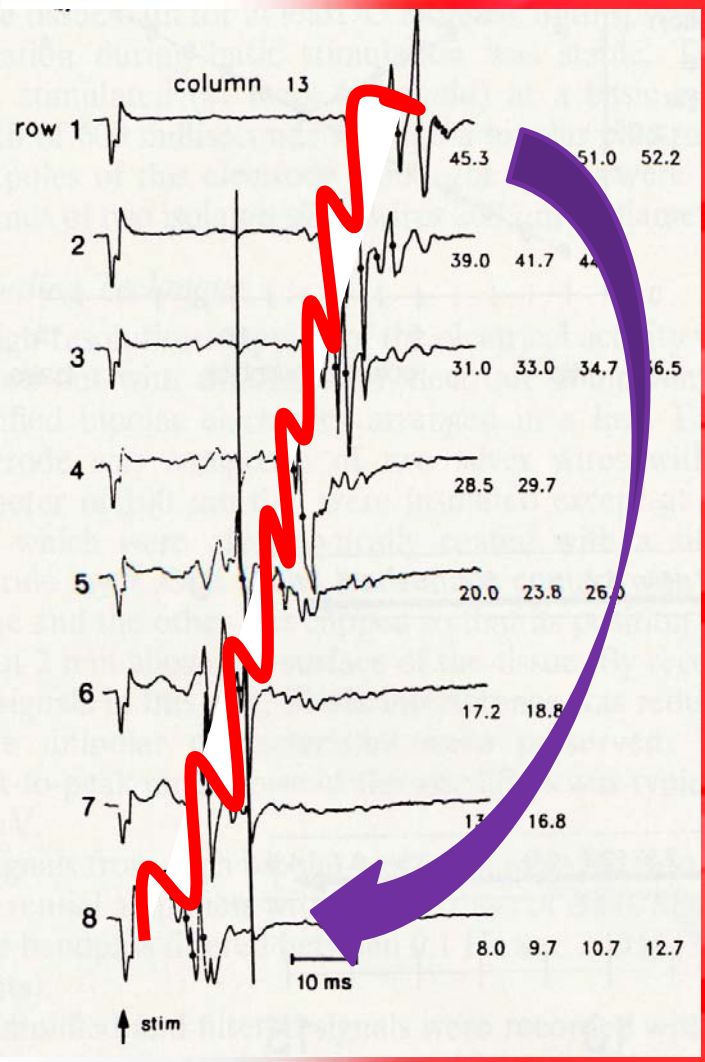
Triggered activity

For a given stable VT, differentiating between the three possible mechanisms is challenging

Reentry

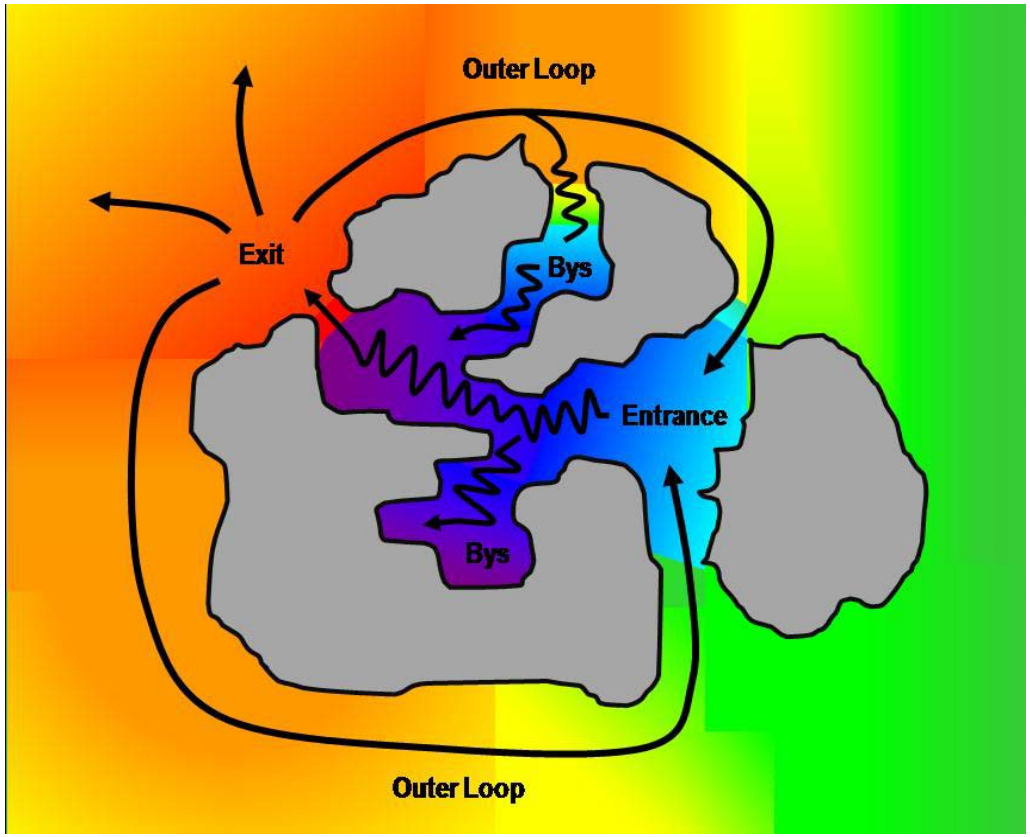






Slow conduction perpendicular to the fiber direction in infarcted myocardial tissue is caused by a ‘’zigzag’’ course of activation at high speed. Activation proceeds along pathways lengthened by branching and merging bundles of surviving myocytes unsheathed by collagenous septa.

	No Structural Heart Disease	Structural Heart Disease
Fibrosis ⇒ VT substrate	No	Yes
Endocardial Mapping Focal VT Macro-Reentrant VT	 >90% <10% (ILVT)	 <10% >90%

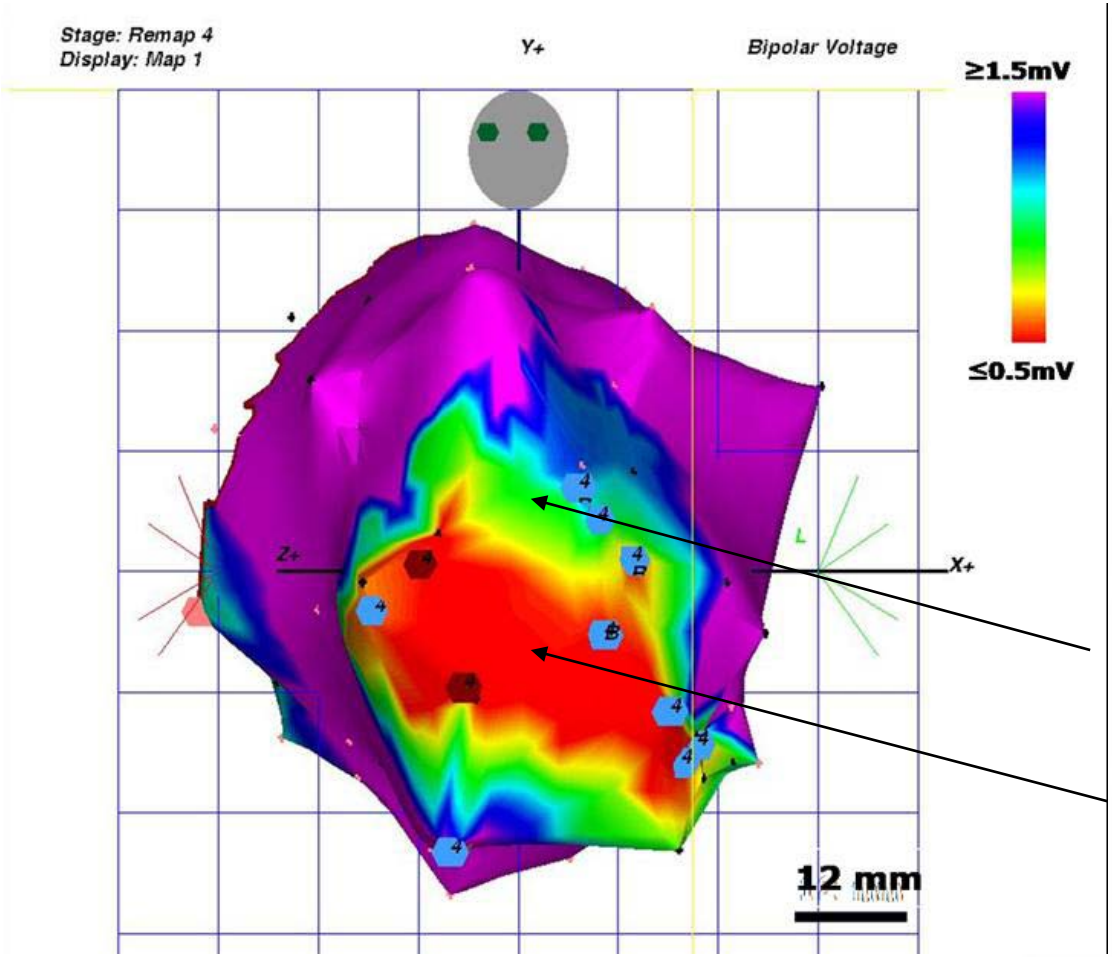


Tools to define the VT isthmus:

- **Activation time mapping**
- **Pace mapping (during SR)**
- **Entrainment mapping (during VT)**

Electroanatomical mapping

Step # 1 = substrate mapping



Healthy myocardium

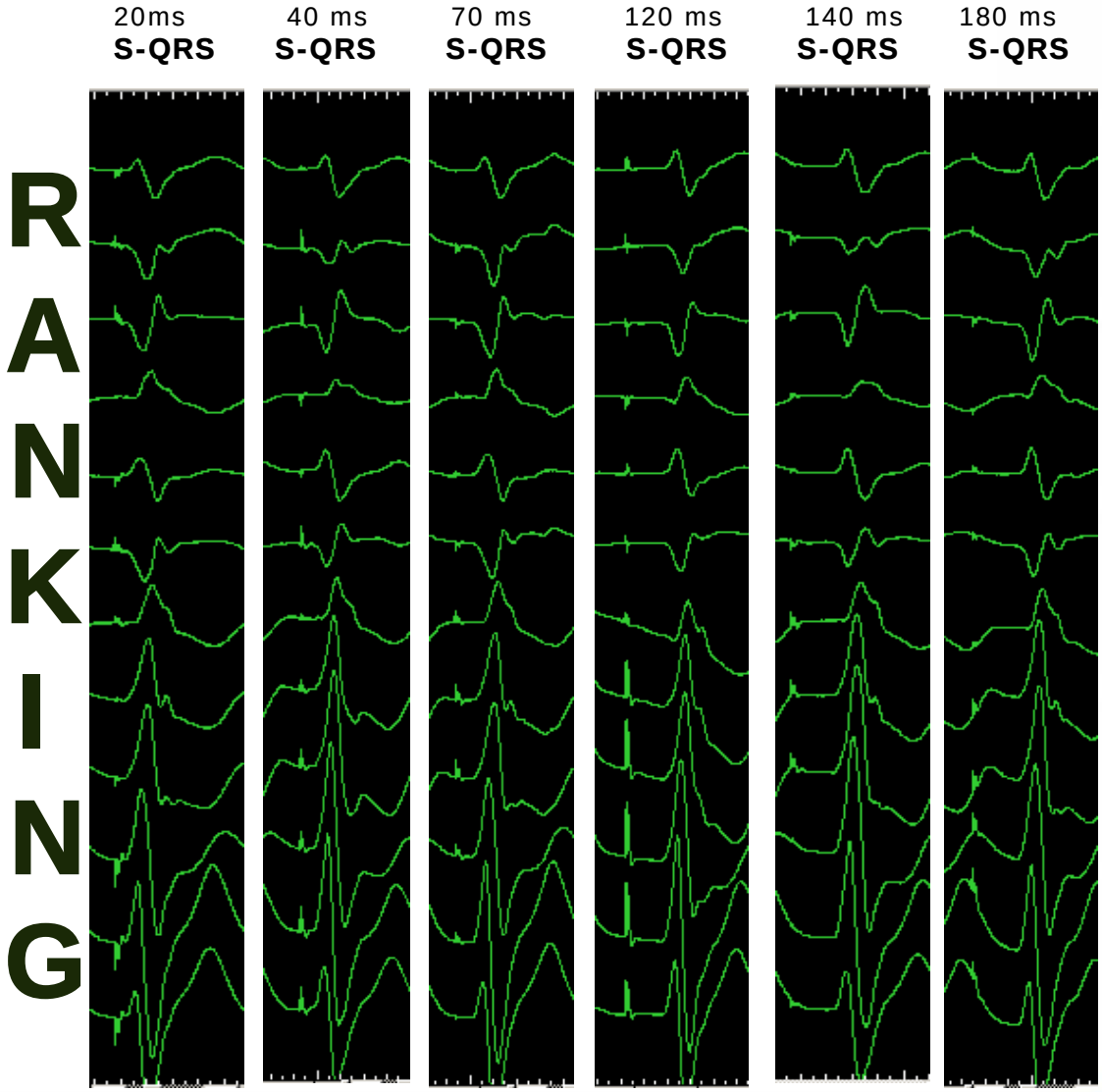
"Border zone"

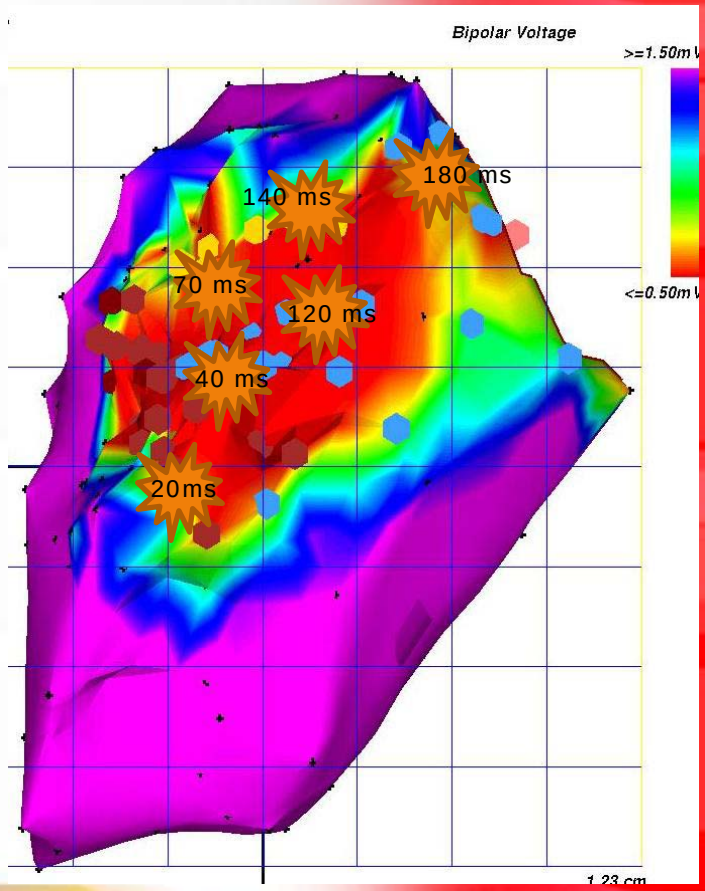
MI "dense scar"

Peri-infarction zone

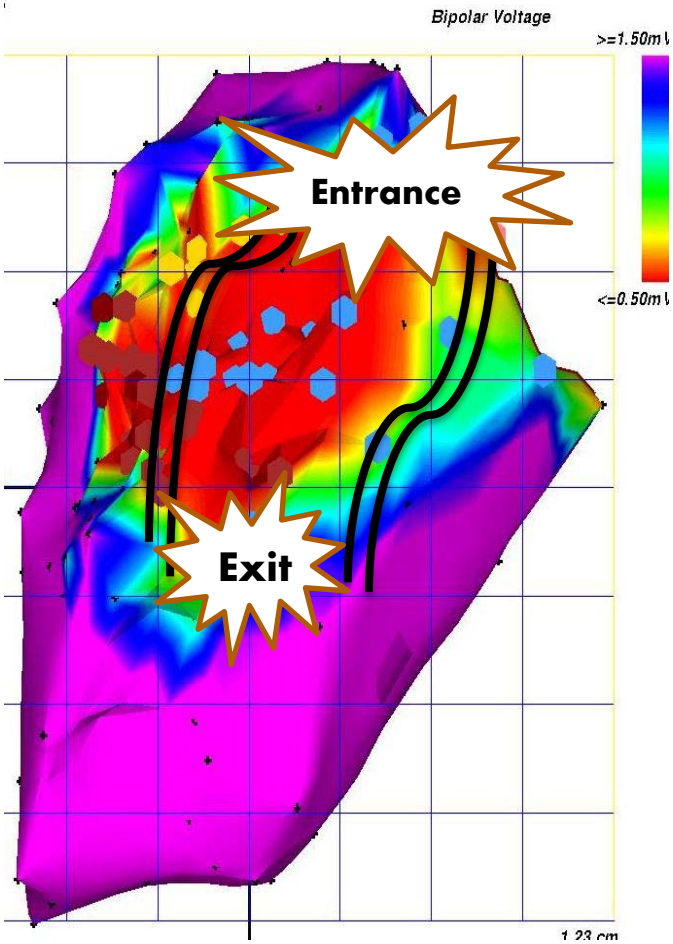
Core of the infarct

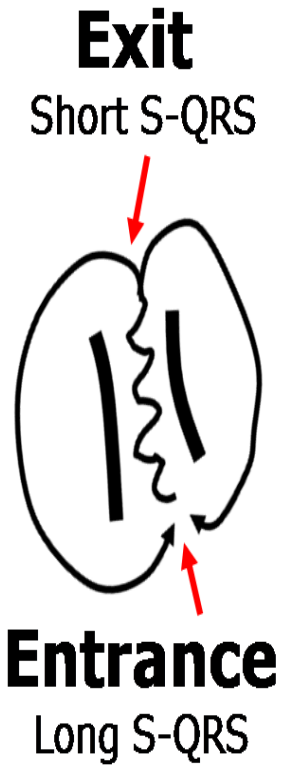
Substrate mapping → Pace mapping

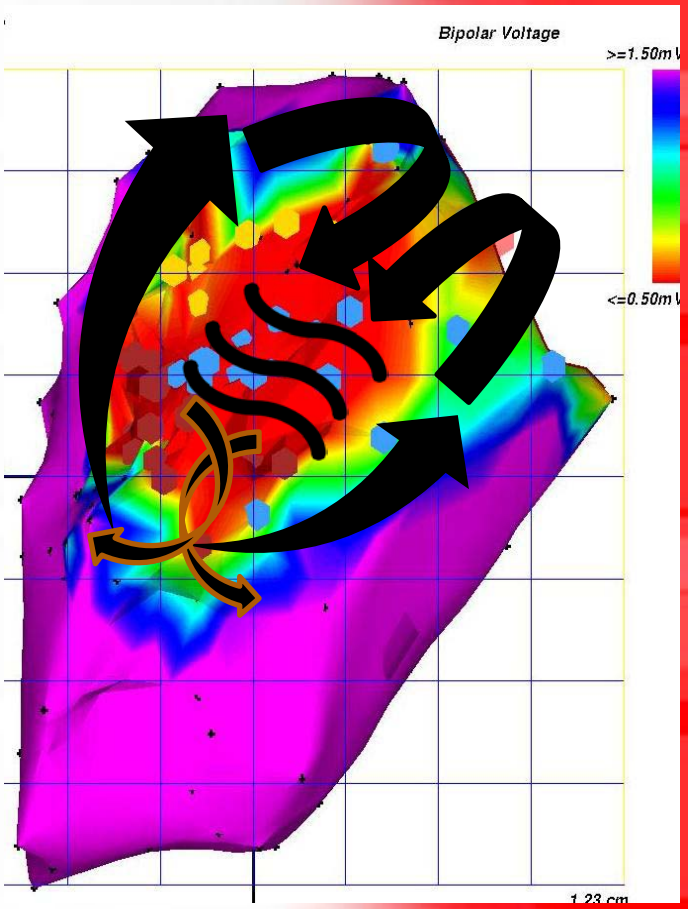




Pace mapping



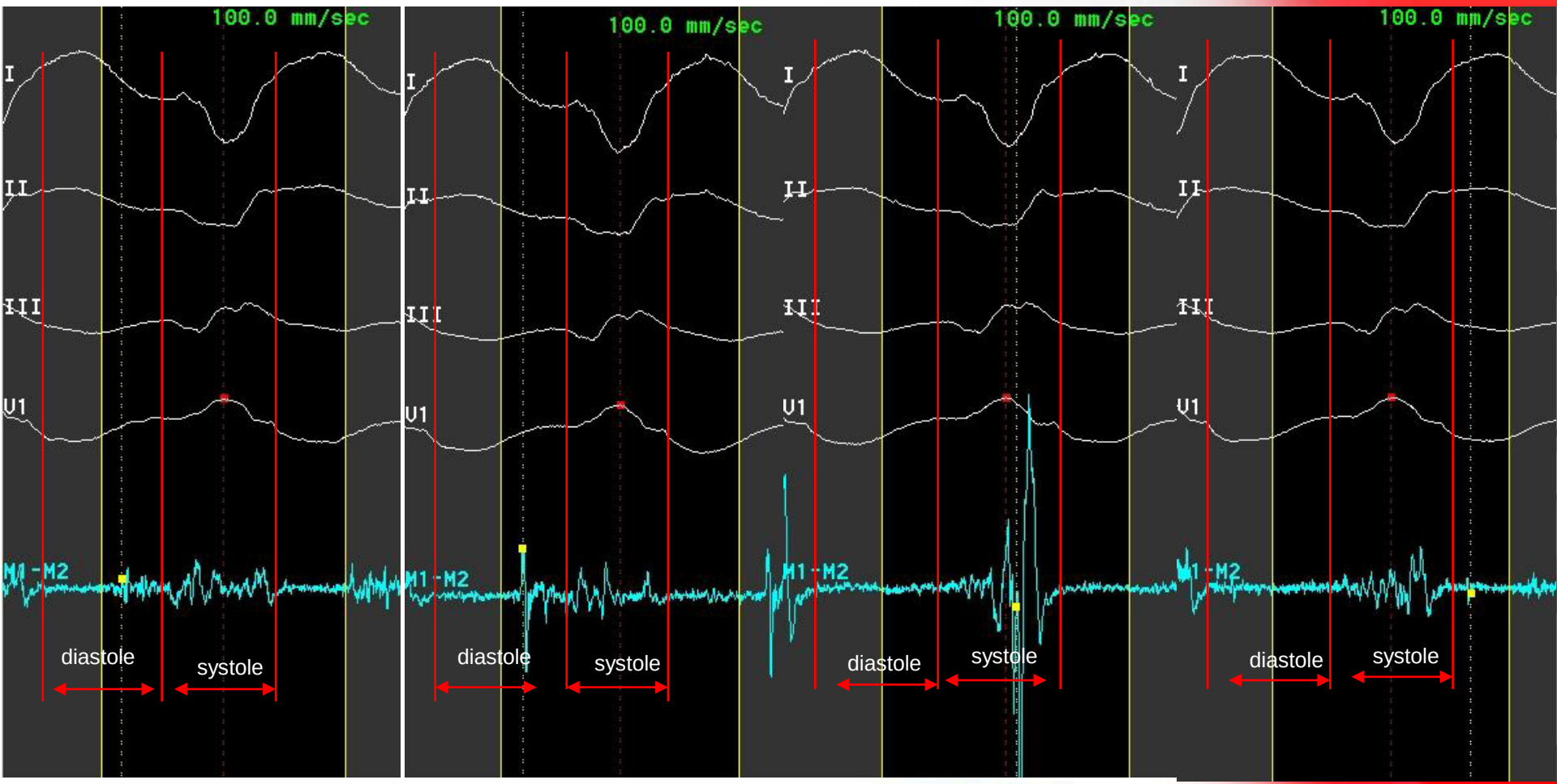


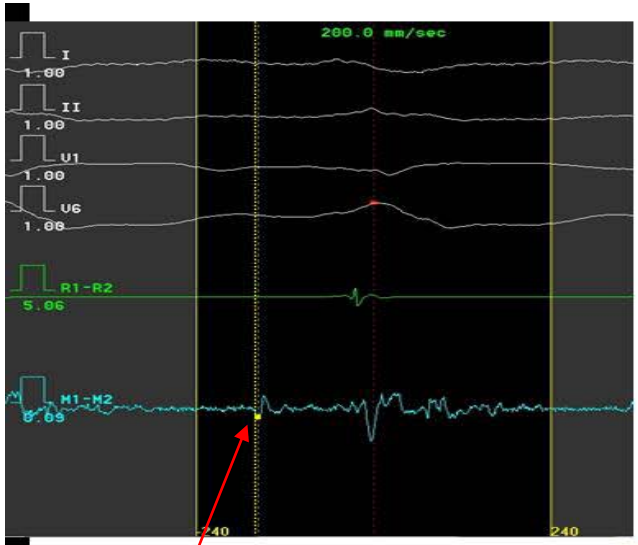


Pace mapping localization

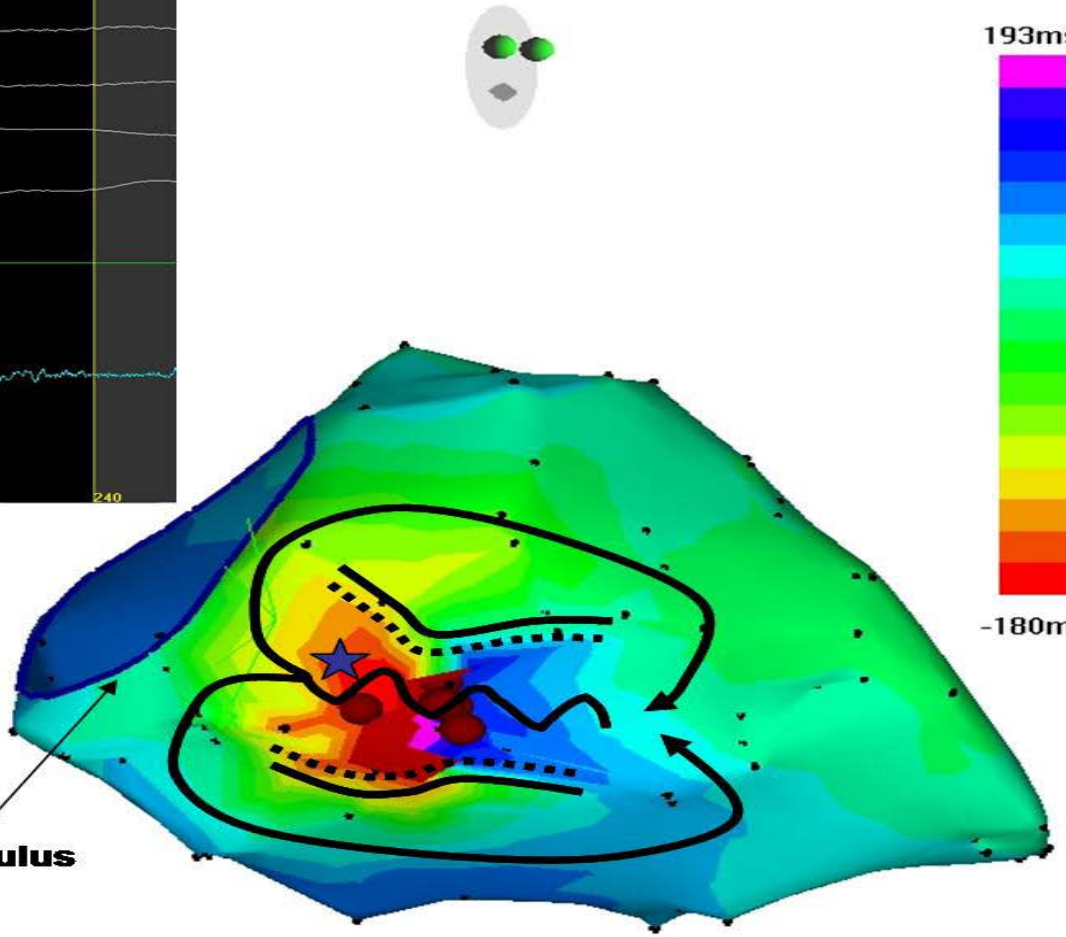
	Remote site	Outer loop	Adjacent Bystander	Isthmus
• PPI - VT CL*	> 30 ms	0-30 ms	> 30 ms	0-30 ms
• 12-lead ECG	QRS fusion	QRS fusion	Concealed fusion	Concealed fusion
• St-QRS	Variable	0-20 ms	> 20 ms	0-20 ms

Step # 2 = VT induction & VT mapping

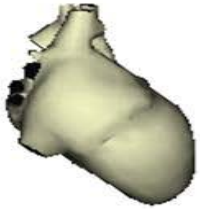




Mid-diastolic late potentials



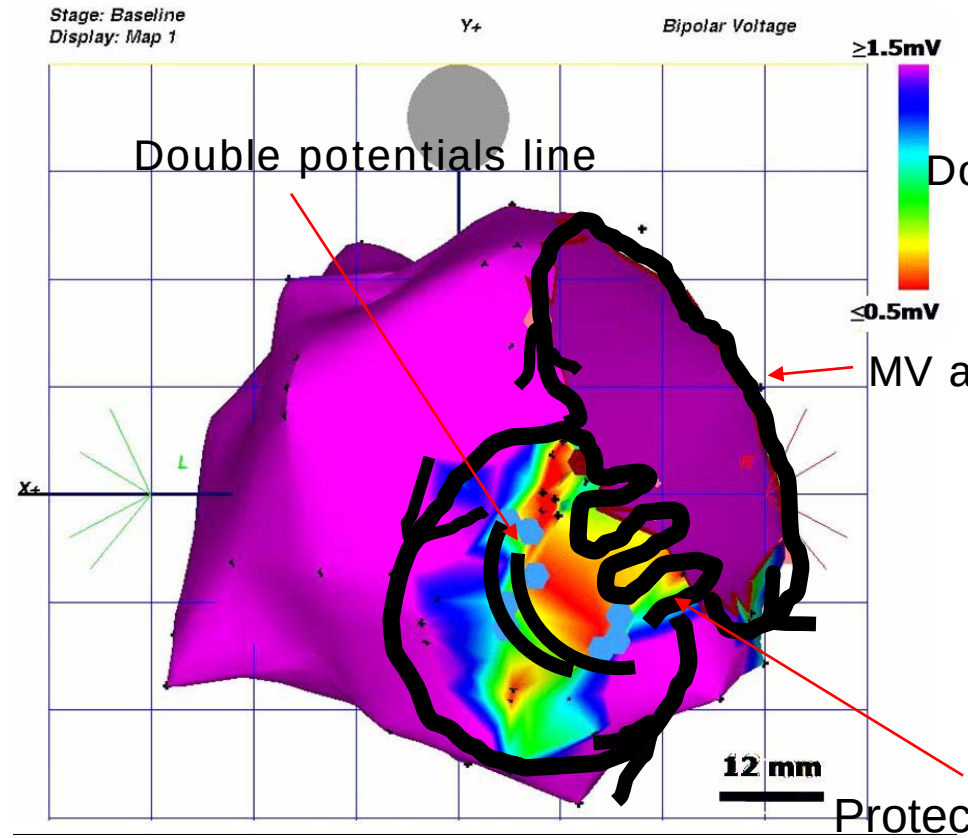
Mitral Annulus

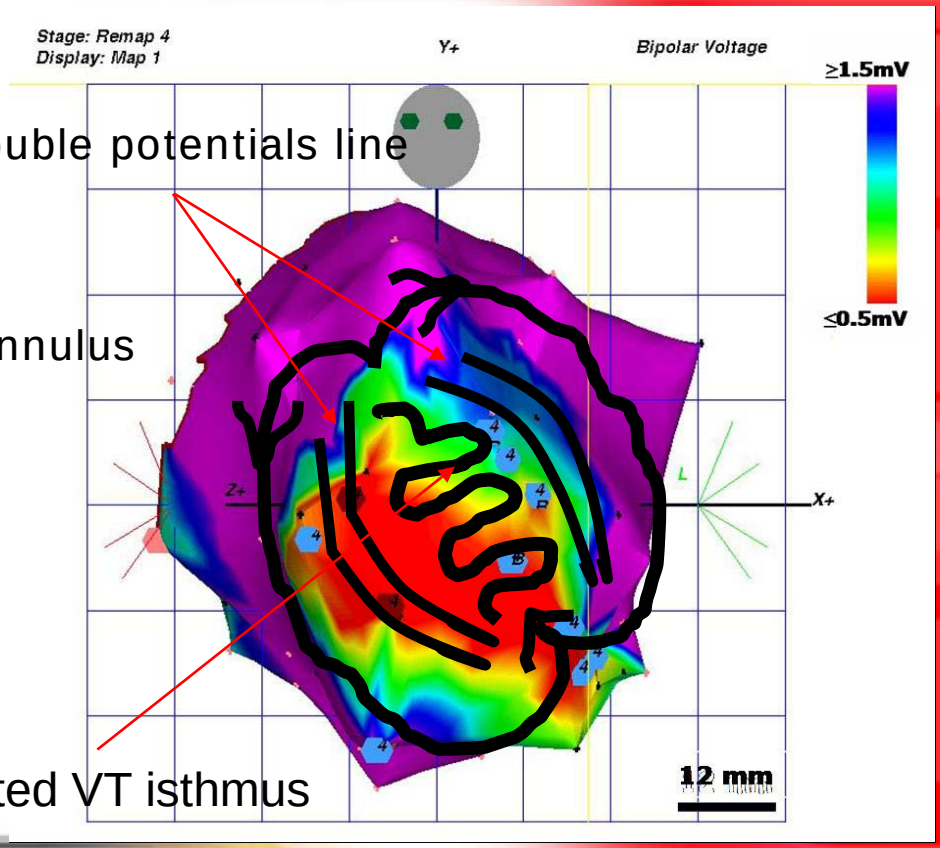


Endocardial reentry > 90% of post-MI mappable VTs

Step # 3 = VT circuit reconstruction

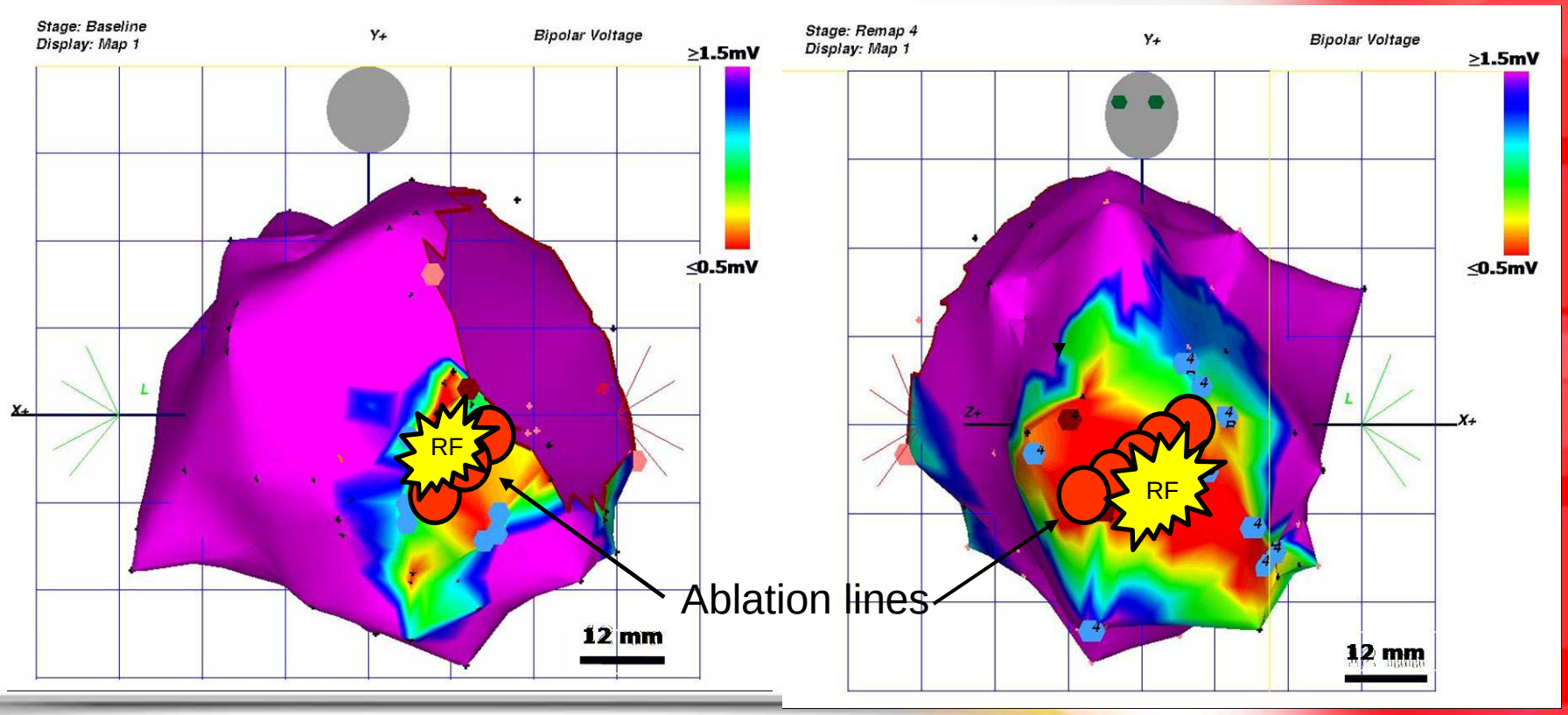
Step # 4 = VT protected isthmus delineation





Step # 5 = Ablation of isthmus ’transection’

Ablation target = site of entrance of a late potential channel



Conclusions

- Prophylactic catheter ablation reduces the incidence of ICD therapy in patients with prior MI and should be considered early in patients with recurrent VT
- Induce VT then interrupt by PES pacing
- Define the VT isthmus
- Ablate and check for NO further inducibility by PES
- Clinical success >75% reduction in VT episodes


THANK YOU