Sunnybrook
HEALTH SCIENCES CENTRE

UNIVERSITY OF TORONTO

Ablation at the time of ICD implantation in secondary prevention patients? - Yes

Ilan Lashevsky MD

Disclosure

- None
- The following presentation is not meant to offend anyone. It all comes with good intentions.


In the beginning God created the heavens and the earth. The earth was formless and void, and darkness was over the surface of the deep, and the Spirit of God was moving over the surface of the waters .... (Genesis)

The next day God created ….

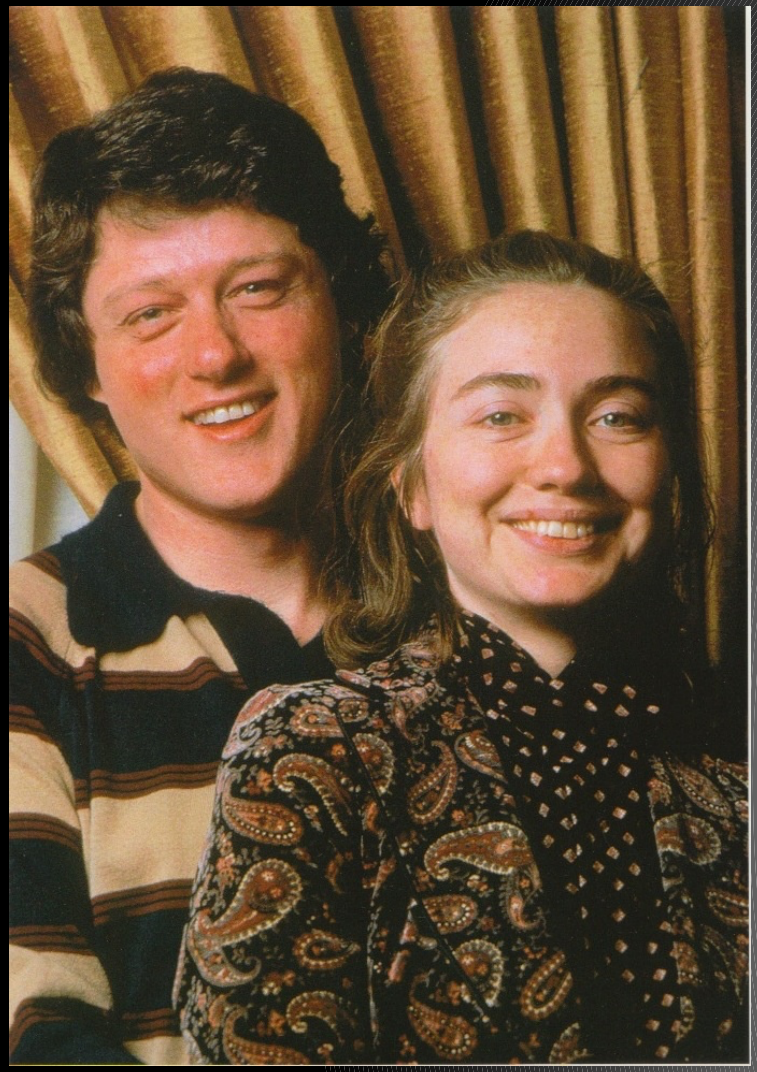
President Obama

ICD

Secondary prevention trials: CIDS, AVID, CASH

Primary and CRT prevention trials : MUSTT, MADIT II ,SCD-Heft and others

Maybe the concept is too old?



The first to challenge the accepted concept – DANISH trial

Maybe it's time for real changes (I want ablation now!)

Grumpy Trump

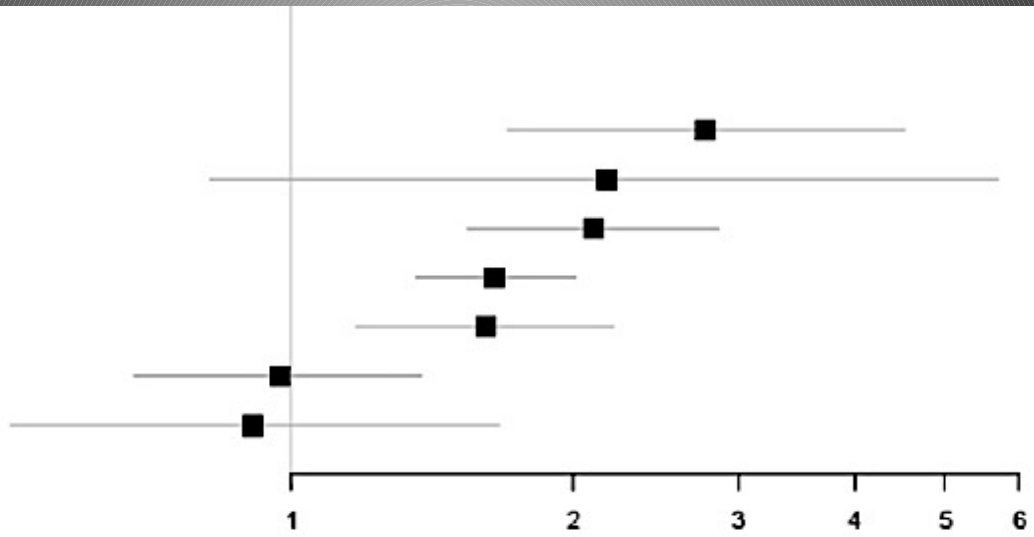
Secondary ICD implantation- clinical considerations

- ICDs effectively terminate VT, but do not prevent VT episodes
- Recurrent of VT up to 30% in the first year
- ICD shocks are associated with more cardiac death
- 5% may not respond to ICD shock (EMD, failure to shock)

Survival After Shock Therapy in Implantable Cardioverter-Defibrillator and Cardiac Resynchronization Therapy-Defibrillator Recipients According to Rhythm Shocked

The ALTITUDE Survival by Rhythm Study

Variable:	OR	95% CI
MVT and PMVT	2.77	(1.70 – 4.51)
NSVT	2.17	(0.82 – 5.70)
VF/PMVT	2.10	(1.54 – 2.86)
MVT	1.65	(1.36 – 2.01)
Atrial fibrillation/flutter	1.61	(1.17 – 2.21)
Sinus tachycardia/SVT	0.97	(0.68 – 1.37)
Noise/artifact/oversensing	0.91	(0.50 – 1.67)



Risk of Death After First Shock Compared With No-Shock Matched Group

J Am Coll Cardiol 2013;62:1674–9

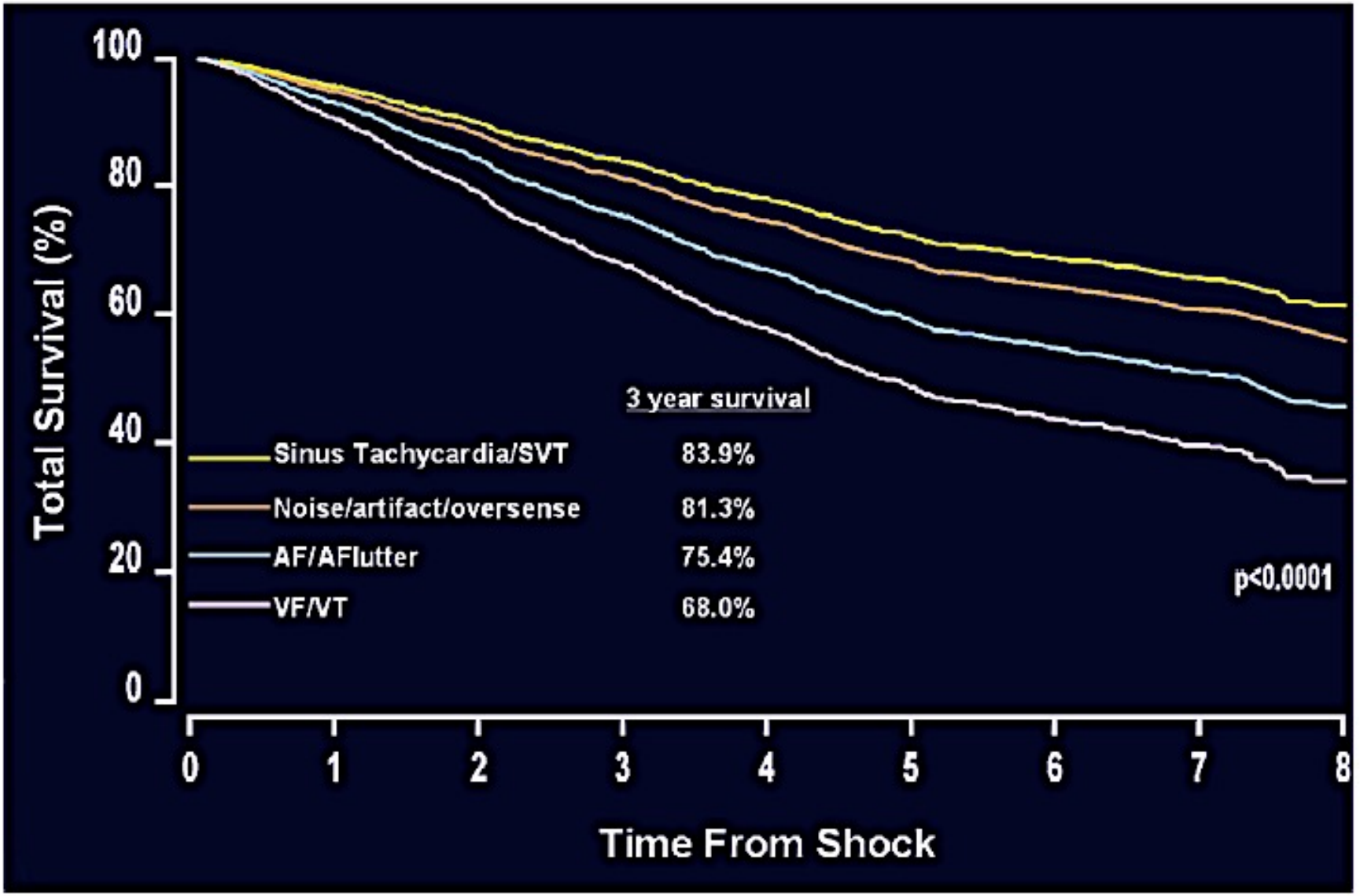
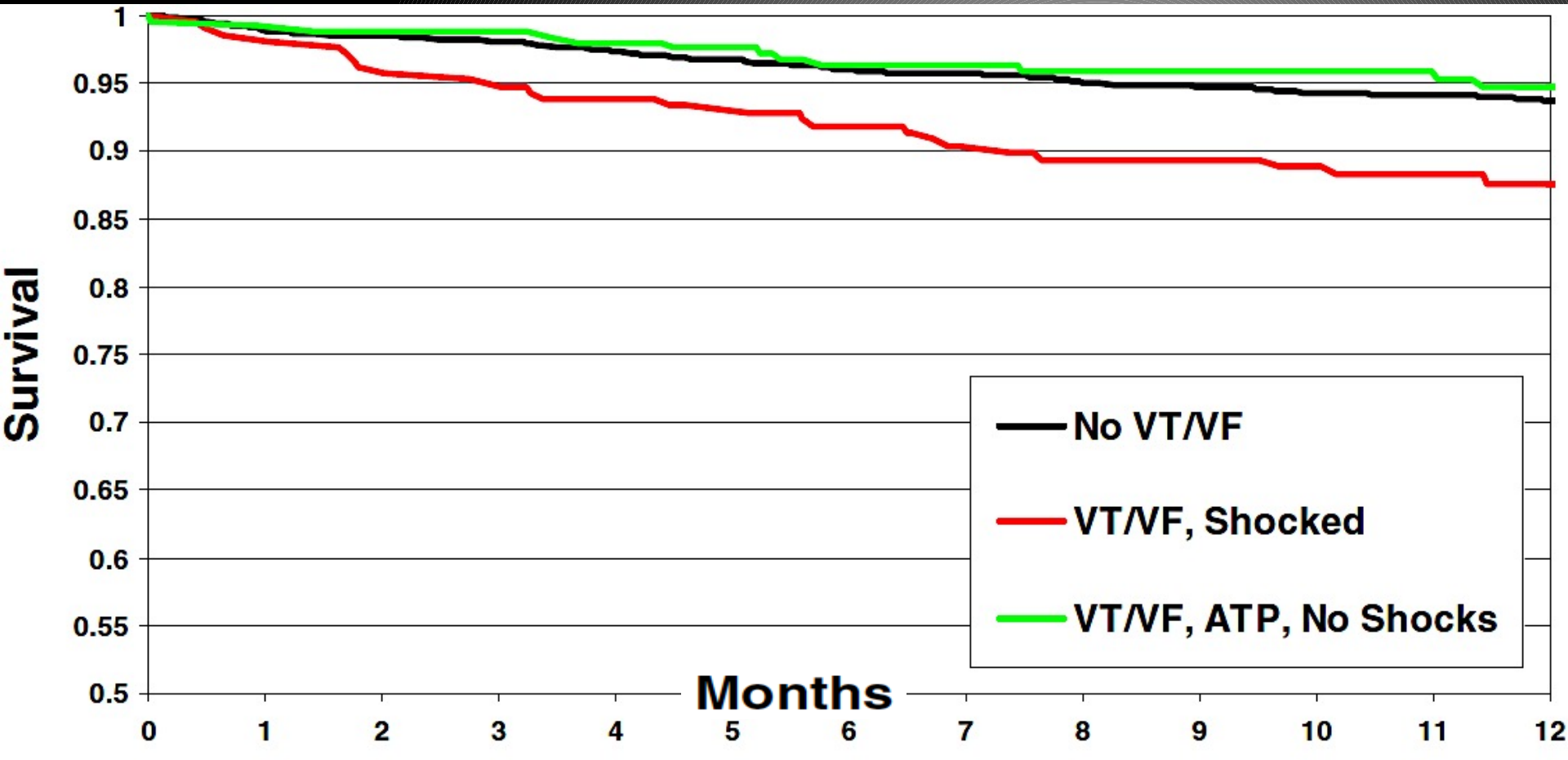


Figure 1 **Survival Based on Rhythm Shocked**

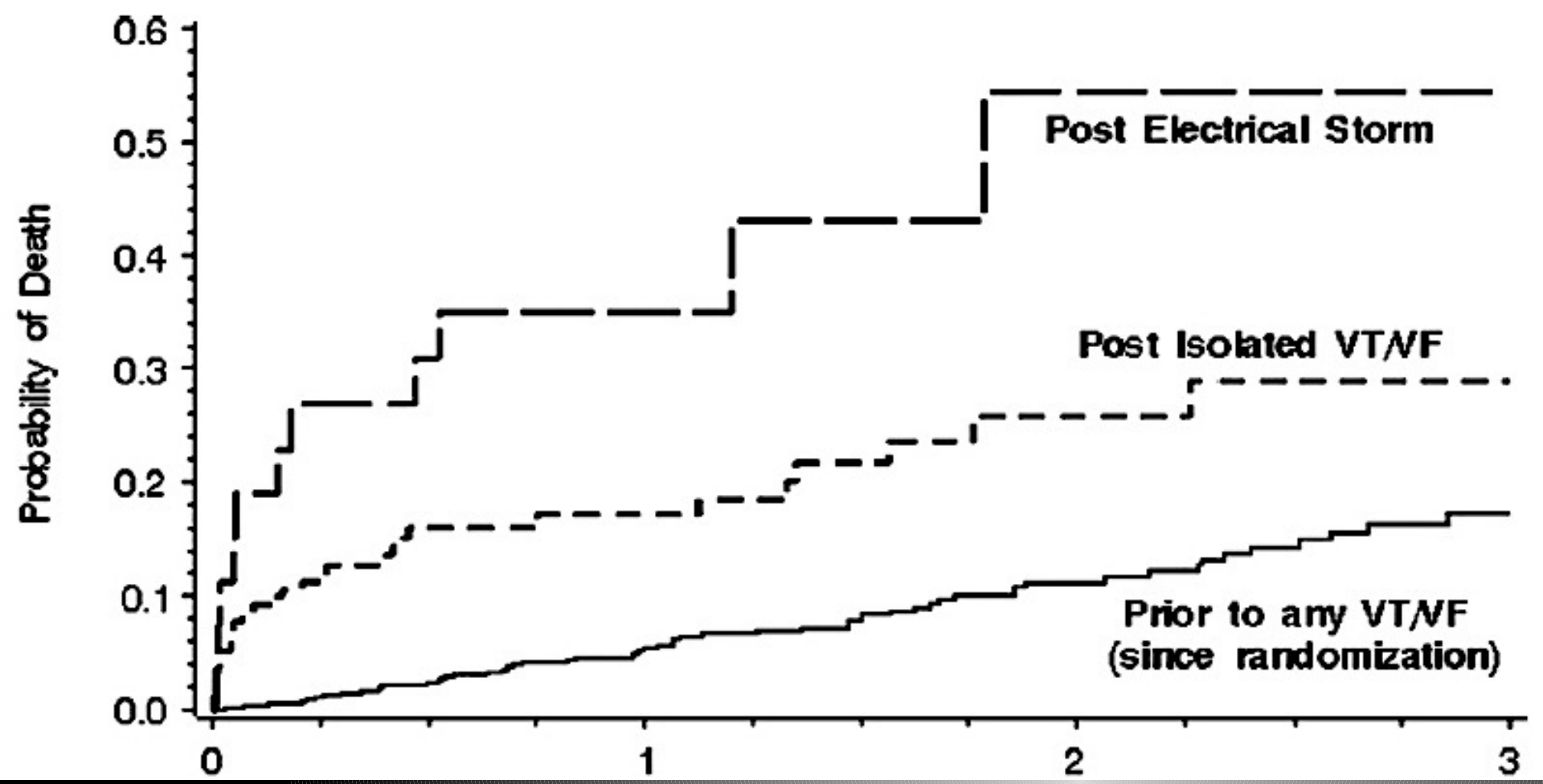
Altitude , J Am Coll Cardiol 2013;62:1674–9

significance



Heart Rhythm, Vol 7, No 3, March 2010

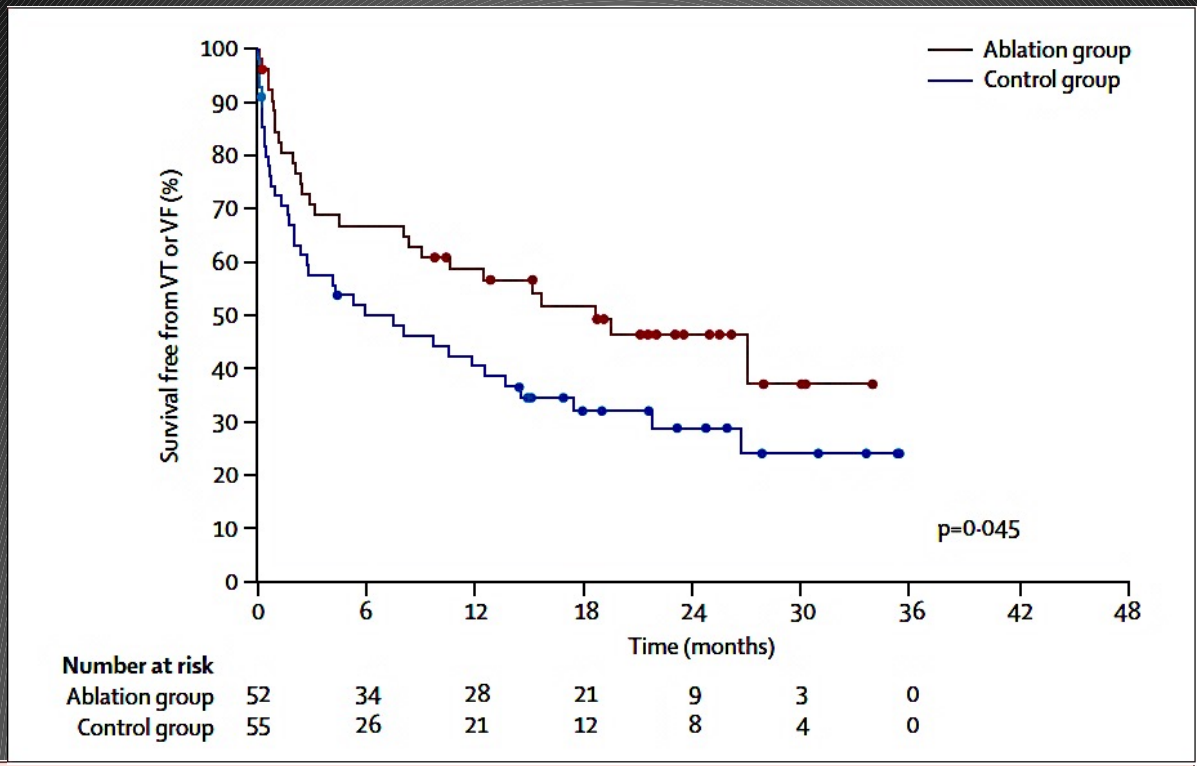
MADIT II sub study (Huang, HR: 11/2007)



VTACH trial *Lancet* 2010; 375: 31–40

The VTACH trial investigated the role of prophylactic catheter ablation followed by ICD implantation in patients with a first episode of stable VT after MI

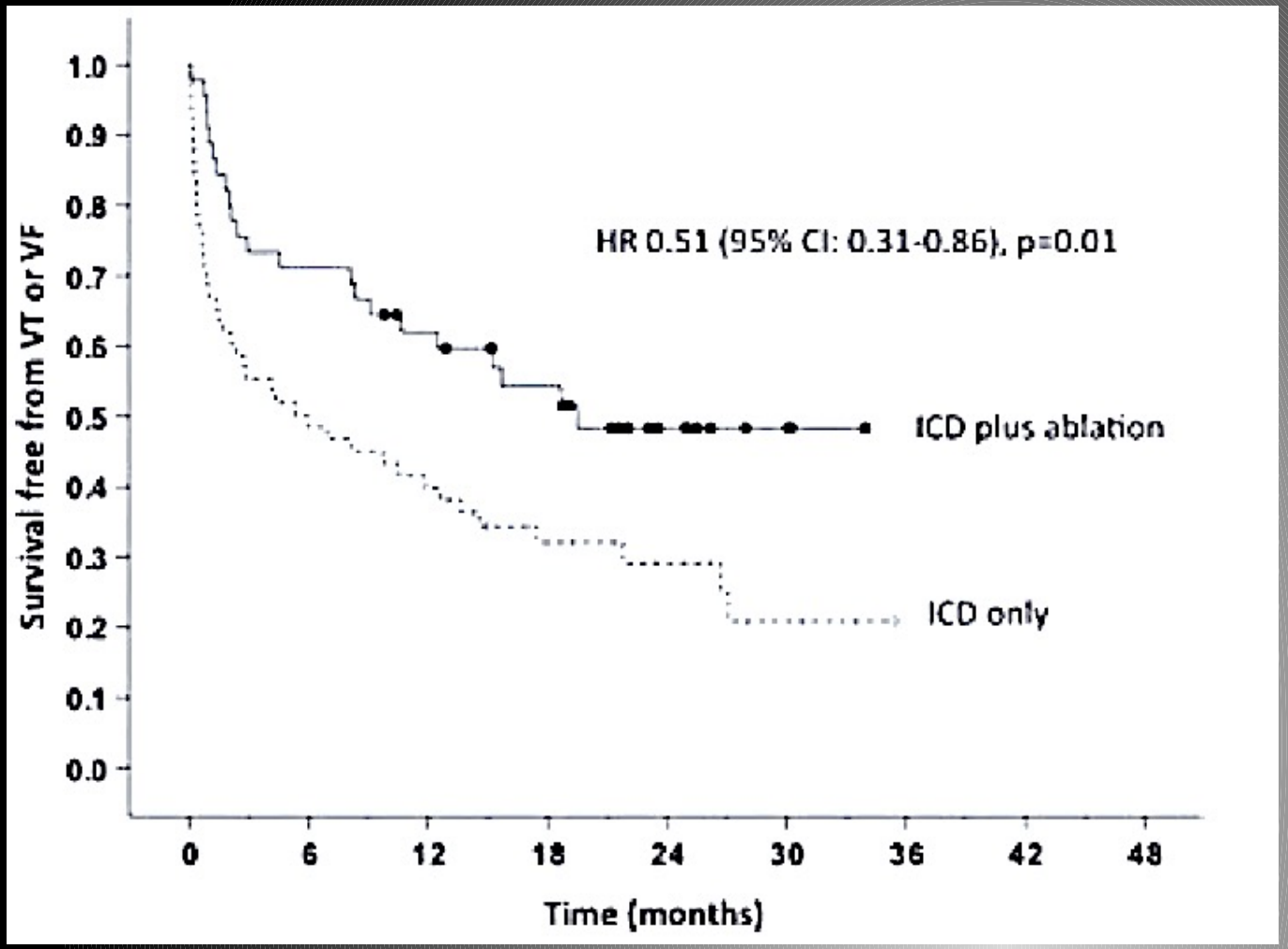
- Patients eligibility:
  - Stable VT X1
  - Previous MI
  - Reduced LVEF (<50%)
  - ICD



Free from

	Ablation (n=52)	Control (n=55)	Hazard ratio (95% CI)	p value
Time to first VT or VF (months, mean [SD]; median [IQR])	15·9 (1·7); 18·6 (2·4*)	11·3 (1·5); 5·9 (0·8–26·7)	0·61 (0·37–0·99)	0·045†
24-month event-free survival estimates (%)‡				
VT recurrence (category 1)	46·6%	28·8%	0·61 (0·37–0·99)	0·045†
VT recurrence (all categories)	46·4%	28·8%	0·61 (0·38–1·01)	0·051†
Hospital admission for cardiac reasons	67·4%	45·4%	0·55 (0·30–0·99)	0·044†
VT storm	75·0%	69·7%	0·73 (0·36–1·50)	0·395†
Syncope	96·2%	85·4%	0·36 (0·07–1·81)	0·197†
Death	91·5%	91·4%	1·32 (0·35–4·94)	0·677†
Appropriate ICD intervention (n [%])	26 (50·0%)	38 (69·1%)	..	0·051§
ICD shock (n [%])	17 (32·7%)	29 (52·7%)	..	0·051§

VTACH: An On-Treatment Analysis



JCE May, 2013

SMASH VT design (secondary prevention ablation trial)

- Previous MI (>1 mo)
- Planned (or had) for ICD – VF, unstable VT, syncope with inducible VT (EPS)
- Primary ICD patients with a single shock
- Exclusion – ongoing ischemia, recurrent VT (storm), AAD
- Follow up 22±5.5 months

Reddy, N Engl J Med 2007

Table 1. Baseline Characteristics of the Patients.*

Characteristic	Ablation Group (N=64)	Control Group (N=64)	P Value
Age — yr	67±9	66±10	0.65†
Male sex — no. (%)	59 (92)	52 (81)	0.12‡
Interval between myocardial infarction and enrollment — yr§	8.8±8.5	7.9±7.8	0.66¶
Index arrhythmia — no. (%)			0.38‡
Ventricular fibrillation	13 (20)	10 (16)	
Ventricular tachycardia	30 (47)	33 (52)	
Syncope with inducible ventricular tachycardia	11 (17)	16 (25)	
Recent ventricular fibrillation or tachycardia treated by a previously implanted ICD	10 (16)	5 (8)	
Left ventricular ejection fraction — %	30.7±9.5	32.9±8.5	0.16†
Left ventricular ejection fraction ≤30% — no. (%)	37 (58)	30 (47)	0.29‡
Left ventricular ejection fraction ≤20% — no. (%)	16 (25)	7 (11)	0.06‡
New York Heart Association functional class — no. (%)			0.37‡
I or II	54 (84)	49 (77)	
III or IV	10 (16)	15 (23)	
Hypertension — no. (%)	47 (73)	43 (67)	0.35‡
Diabetes — no. (%)	24 (38)	32 (50)	0.21‡
Previous revascularization (PTCA or CABG) — no. (%)	46 (72)	40 (62)	0.35‡
Previous stroke — no. (%)	3 (5)	8 (12)	0.21‡
Medication — no. (%)			
Class I or class III drugs	0	0	—
Beta-blockers	60 (94)	63 (98)	0.37‡
ACE inhibitors or angiotensin-receptor blockers	59 (92)	59 (92)	1.0‡
Statins	37 (58)	38 (59)	1.0‡
Aspirin	52 (81)	39 (61)	0.02‡
Type of ICD — no. (%)			0.21‡
Single-chamber	23 (36)	31 (48)	
Dual-chamber	41 (64)	33 (52)	

SMASH VT

Table 2. End Points.*

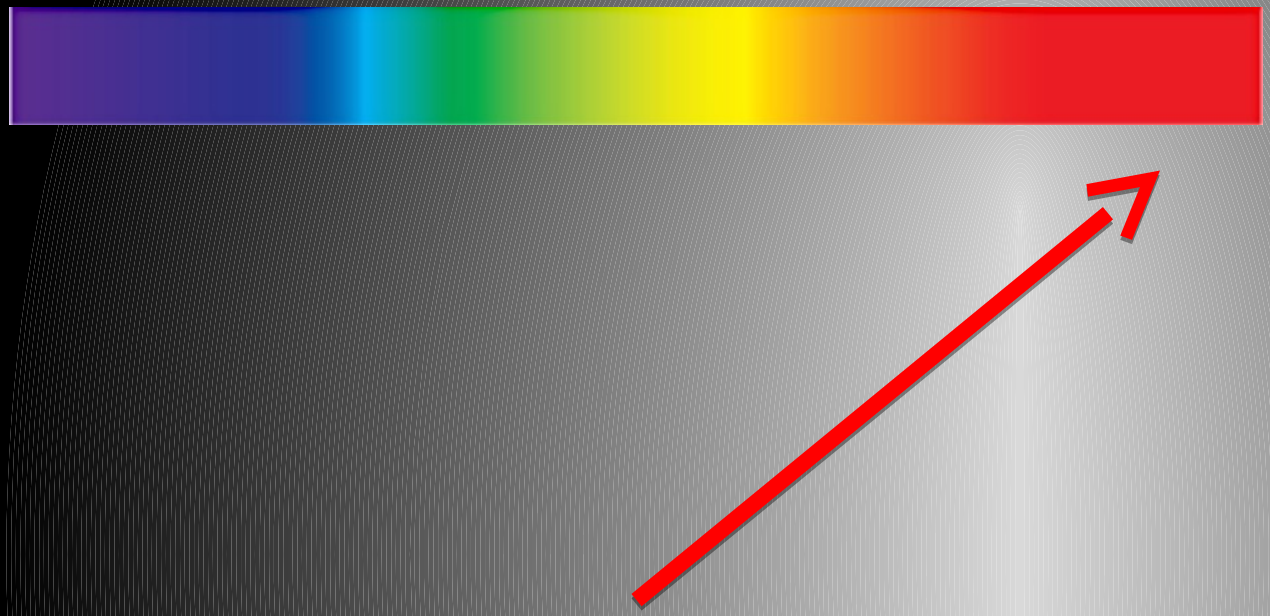
Variable	Ablation Group (N = 64)	Control Group (N = 64)	Hazard Ratio (95% CI)	P Value
	no. of patients (%)			
ICD events*	8 (12)	21 (33)	0.35 (0.15–0.78)	0.007†
ICD shocks	6 (9)	20 (31)	0.27 (0.11–0.67)	0.003†
ICD storms	4 (6)	12 (19)	0.30 (0.09–1.00)	0.06‡
Death	6 (9)	11 (17)	0.59 (0.22–1.59)	0.29†
Congestive heart failure	3 (5)	6 (9)		
Ventricular tachycardia storm	0	1 (2)		
Cancer	1 (2)	0		
Pulmonary embolism	1 (2)	0		
Unknown	1 (2)	4 (6)		

Reddy, N Engl J Med 2007

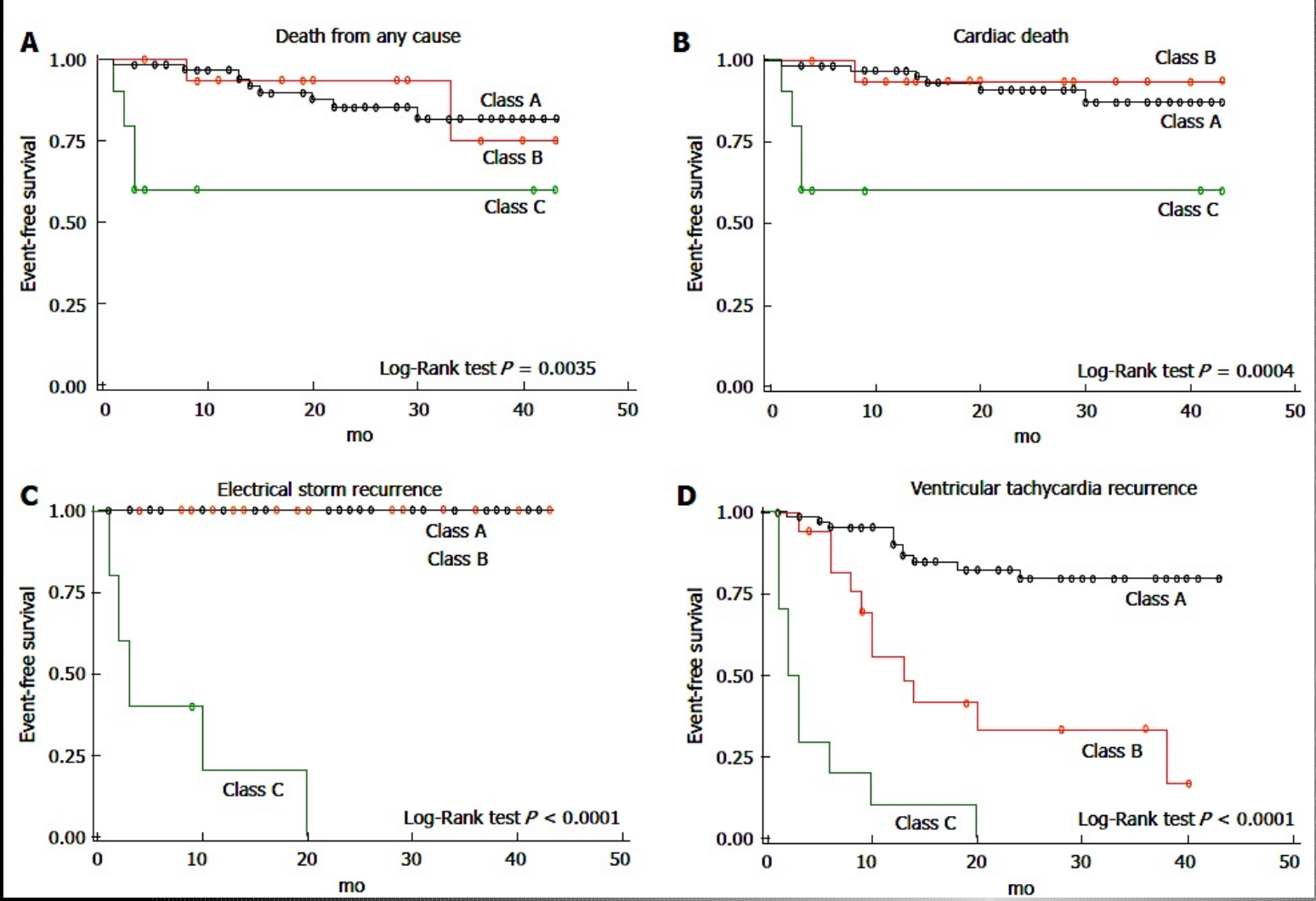
The importance of the randomized studies

The importance of these trials is not in the answers they provide, but rather the question they pose: **is ICD all we can offer to our patients?**

Who benefit from ablation the most?

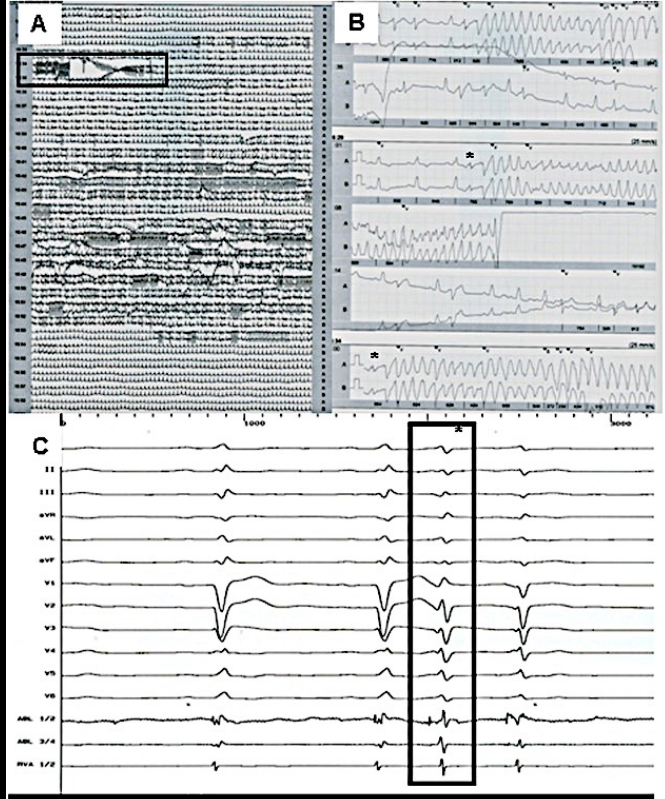


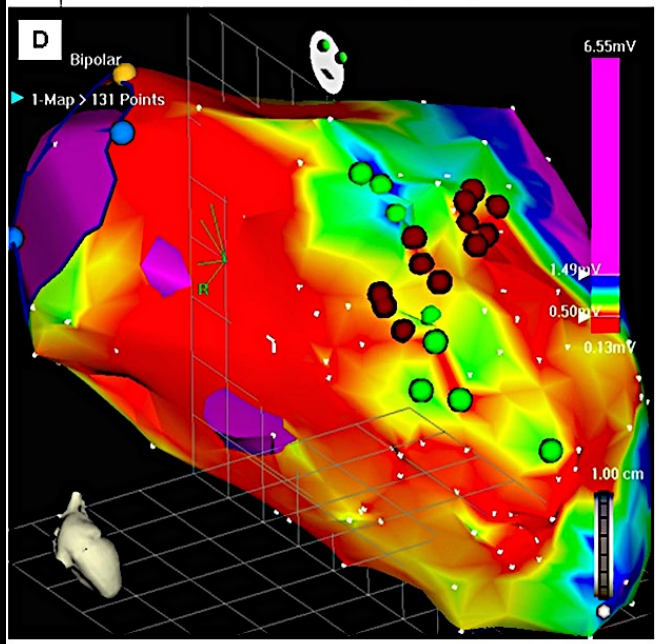
Ablation in VT storm – ICM

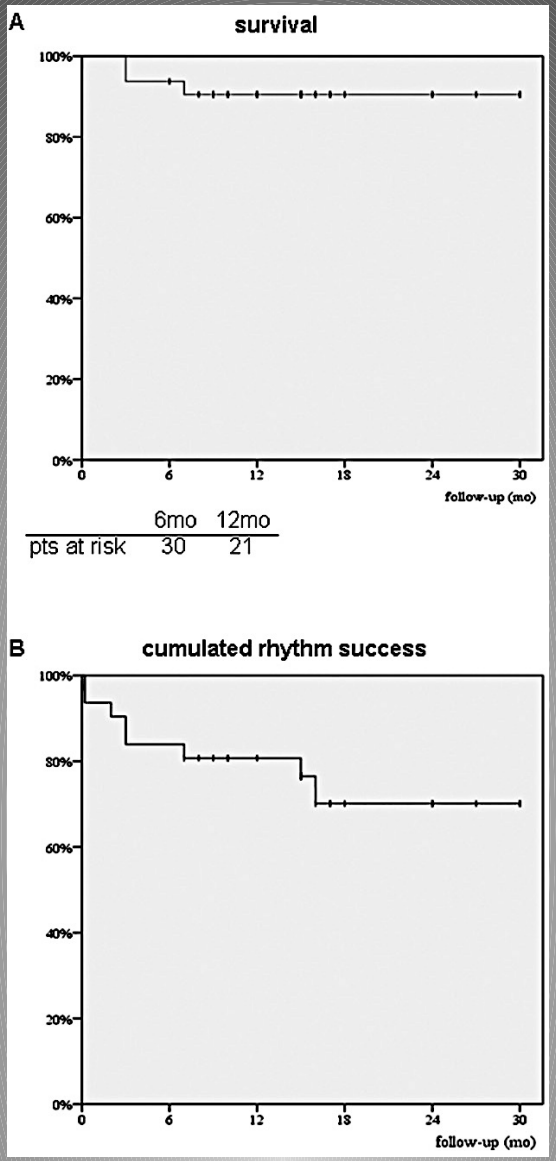


Carbucicchio, Circulation 2008; **117**: 462-469

Catheter Ablation of Electrical Storm in ICM/NICM







Am J Cardiol 2011;108:233–239

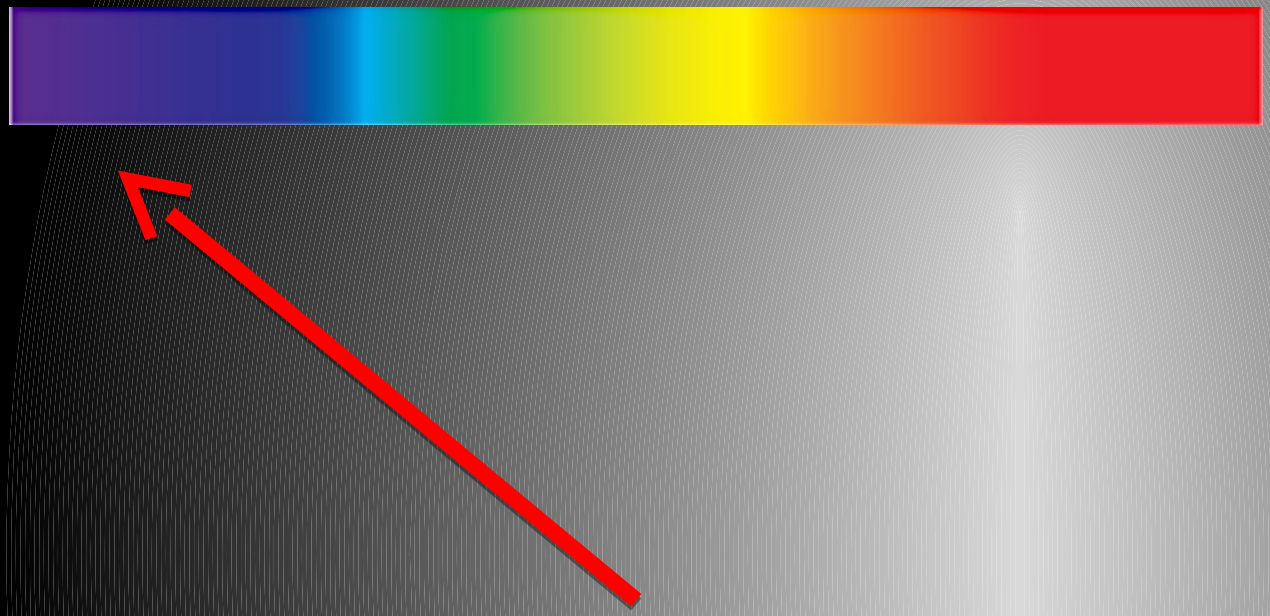
Ablation of VPCs in Channelopathy

Murakoshi,Journal of Arr.,32(2016)404–410

Table 1
Summary of case reports of catheter ablation for ventricular tachyarrhythmias in patients with channelopathies.

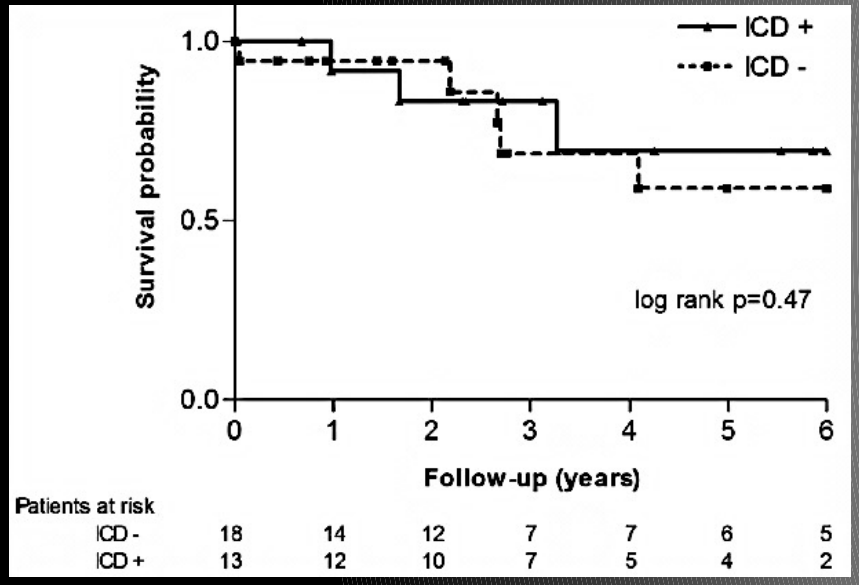
Diagnosis	Authors	*n*	Age/Sex	Symptoms	Genes	VPC morphology/origin	Electrophysiology	Ablation	Outcome	Ref
BrS	Haïssaguerre et al.	3	39 ± 7, 2 males, 1 female	Syncope, PVT, VF	*SCN5A* mutation (2850delT) in 1	#1 RVOT in 2 pts #2 LBBB superior axis/anterior; RV Purkinje network in 1 pt.	#1 CI: 340 ± 20, 408 ± 15 ms #2 CI: 278 ± 29 ms	Successful ABL for VPCs	No rec (7 ± 6 mo)	#7
	Darmon et al.	1	18, male	Frequent VF, PVT	Not described	Posterior RVOT	-	Successful ABL for VPCs and AT	No rec (6 mo)	#9
	Nakagawa et al.	1	41, male	VF storm	Not described	LBBB inferior axis/RVOT	CI: 390–450 ms	Successful ABL for VPCs	No VF rec (29 mo)	#10
	Nademanee et al.	9	38, all males	All had out-of-hospital cardiac arrests.	Not performed	Not described	Low voltage (0.94 ± 0.79 mV), prolonged duration (132 ± 48 ms), and fractionated late potentials (96 ± 47 ms beyond QRS complex) in the anterior RVOT epicardium.	Successful ABL for substrate in the anterior of RVOT epicardium.	Only 1 of 9 pts had VF rec (20 ± 9 mo)	#8
	Sunsaneewitayakul et al.	10	36.5, all male	4 had frequent VF or storm; 6 had syncope or VF episodes.	Not performed	Posterolateral RV in 1 pt. No VPCs in 9 pts.	Late activation zone (where electrical activity was recorded by isopotential map within J point to J point + 60 ms) was observed in all patients.	Successful ABL for substrate at late activation zone of RVOT. 1 pt. had CRBBB during procedure.	Modified Brugada ECG in 3 of 4 pts (75%) and no VF storm in 4 (100%) (12–30 mo).	#11
IVF	Aizawa et al.	1	13, male	Convulsion, VF	Not described	#1 RBBB/posterolateral LV #2 LBBB superior axis/RV	Fractionated activities were recorded at posterolateral LV, J wave (+).	ABL for VPCs	VF rec 1.5 mo after 1st ABL, but no rec 3 mo after 2nd ABL.	#23
	Ashida et al.	1	18, female	Syncope, TdP	Not described	LBBB inferior axis/RVOT	QT/QTc 0.39/0.3 ms. CI: 380 ms, J wave (-)	Successful ABL for VPC	No TdP and syncope (3 yr)	#13
	Takatsuki et al.	1	62, male	Syncope, VF	Not described	RVOT	CI: 320–330 ms, J wave (-)	Successful ABL for VPC	no VF rec (20 mo)	#14
	Haïssaguerre et al.	27	41 ± 14, 13 males, 14 females	VF (23 during daily activity and 4 during sleep); LQT and Brugada ECG were excluded.	12 pts had no mutations in *SCN5A* and *KCNH2*	RBBB 10, LBBB 13, both 4. #1 Purkinje system in 23 (LV septum in 10, anterior RV in 9, both in 4) #2 RVOT in 4.	CI: 20–160 ms (75 ± 42) #1 The interval from the Purkinje potential to the following myocardial activation: 10–150 ms (38 ± 28 ms) during premature beats, 11 ± 5 ms during sinus rhythm.	Successful ABL for VPCs	24 pts (89%) had no VF rec without drug (24 ± 28 mo). 3 pts had late rec.	#15
	Betts et al.	1	32, male	Syncope, VF storm	Not described	LBBB/RVOT free wall	CI: 260–300 ms	Successful ABL for VPC	No VF rec (11 mo)	#16
	Nogami et al.	1	54, male	Syncope, VF	No mutation in SCN5A	#1 RBBB inferior axis/LV septum #2 RBBB northwest axis/LV	#1 CI: 280 ms #2 CI: 260 ms diastolic Purkinje potential and presystolic Purkinje potential were recorded from LV during PVT.	Successful ABL for VPC but isolated VPC was inducible.	No VF and syncope rec (4 yr) without drugs.	#18
	Noda et al.	16	39 ± 10, 7 males, 9 females	Syncope, VF, polymorphic VT (VF in 5 pts)	Not described	LBBB 16/RVOT septum 13, free wall 3	CI: 409 ± 62 ms, CL: 245 ± 28 ms, polymorphic changes of the QRS complex during rapid pacing in 2 pts.	Successful ABL for VPCs in 13, partially successful in 3.	No syncope, VF, SCDs (54 ± 39 months) (4 patients received a β-blocker).	#17
	Latcu DG et al	1	57, male	Aborted SCD, recurrent VF	Not described	RBBB/inferoseptal LV near posterior hemibranch (small number of VPCs)	J wave in inferior leads, no scar.	Successful ABL, J wave disappeared.	No VF rec and no occurrence of J wave (2 months).	#24
LQTS	Haïssaguerre et al	4	37 ± 8, 2 males, 2 females	Syncope, PVT, VF	No mutation in KCNQ1, KCNH2, and SCN5A	#1 LBBB inferior axis /RVOT in 1 pt. #2 RBBB superior axis/ Purkinje in LV in 1 pt. #3 Polymorphic, repetitive (bidirectional) with a positive morphology in V1/ Purkinje in LV in 2 pts.	#1, #2 CI: 503 ± 29 ms. #3 PVT cycle length: 280–420 ms lasting 3 to 45 beats, Purkinje potential proceeded VPCs/repetitive beats.	Successful ABL for VPCs	No VF rec (24 ± 20 mo), 1 pt had a rec of VPCs.	#7
	Srivathsan et al	1	39, female	VF	Not described	Purkinje in midposterior septal LV	CI: 340 ms Purkinje potential preceded VPCs by 30 ms.	Successful ABL for VPCs	No rec (6 mo)	#28

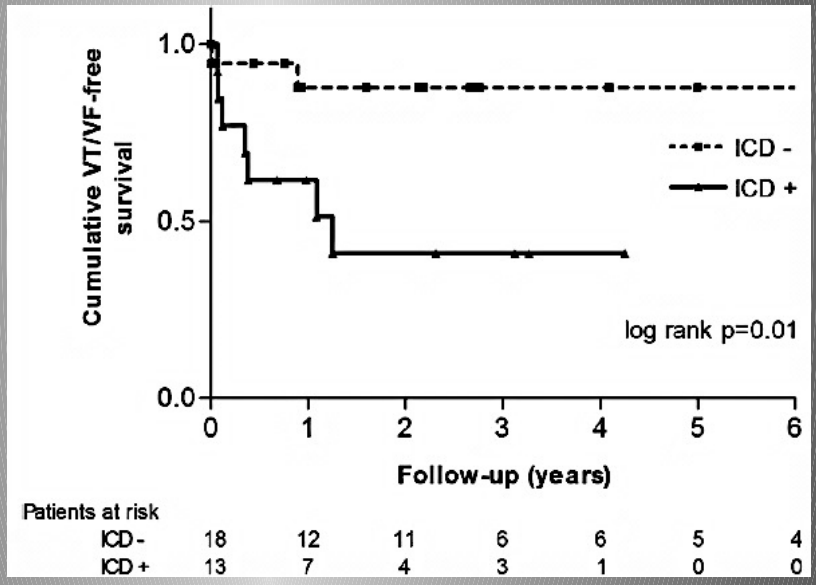
Who may benefit from ablation the most?



VT Ablation in Patients With Preserved LV Function
(CAD, stable VT, LVEF>40%)

- 31 pts - all had VT ablation
- Successful ablation achieved in: clinical 90% (28/31) and all inducible 58% (18/31)
- 13/31pts received ICD (ICD+)
- Mean LVEF - 48 ± 6%
- Mean VT CL - 348 ± 70msec (172bpm)
- F/U - 3.8 ± 2.9 years
- No SCD in ICD (-) group





Clemens, JCE, Oct 2015

VT ablation in structural heart disease with preserved EF without ICD

- 166 patients had VT ablation **only**
- Control Group - 378 pts with stable VT and ICD
- SHD – ICM, NICM, ARVD
- Stable VT
- LVEF 50±10%
- **F/U -** 32+27 months
- **Results:**

  87% successful ablation

  12% all cause mortality (12% in the control group)

  2.4% SCD

  12% required ICD

Maury, European Heart Journal (2014) 35, 1479–1485

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APPROPRIATE USE CRITERIA

ACCF/HRS/AHA/ASE/HFSA/SCAI/SCCT/SCMR 2013 Appropriate Use Criteria for Implantable Cardioverter-Defibrillators and Cardiac Resynchronization Therapy

A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Heart Rhythm Society, American Heart Association, American Society of Echocardiography, Heart Failure Society of America, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance

Endorsed by the American Geriatrics Society

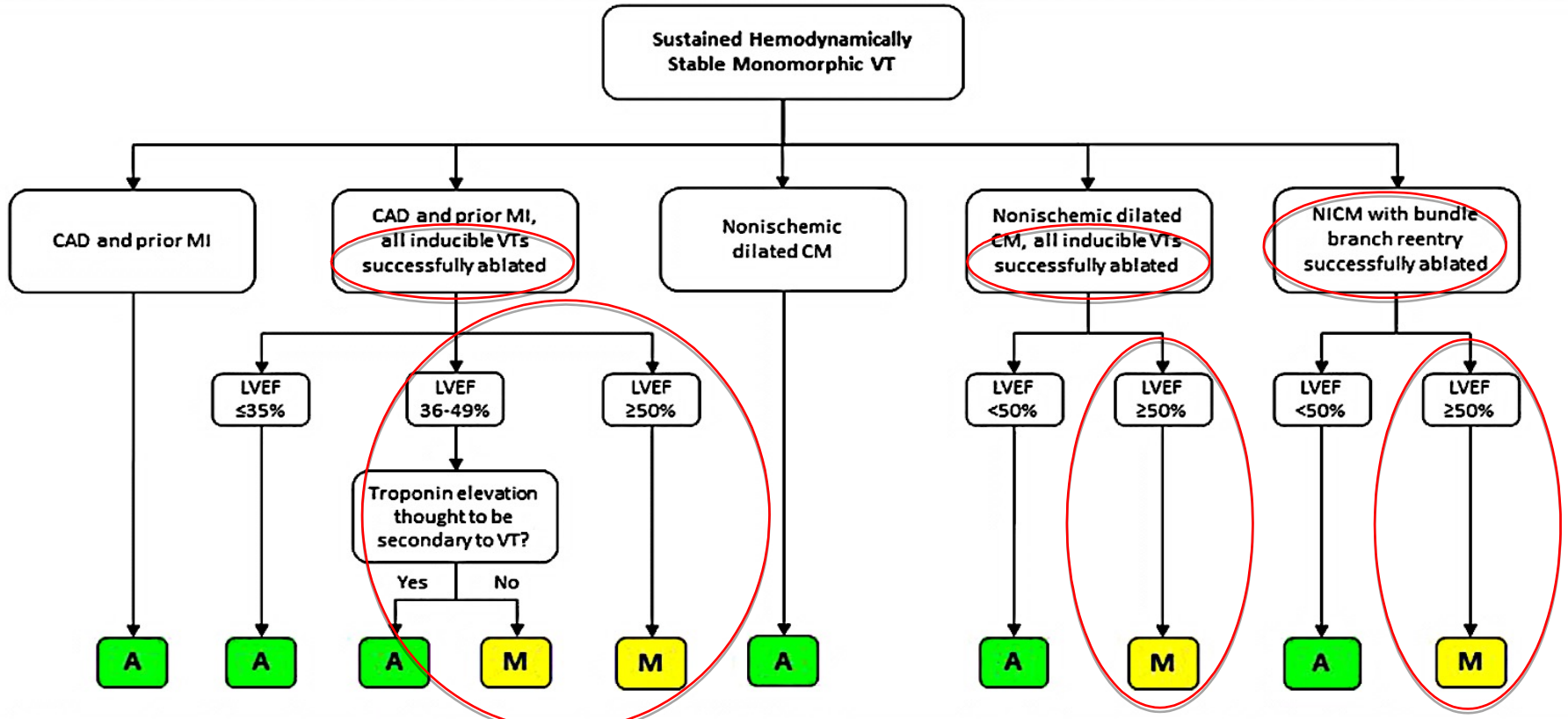


Figure 8. Secondary Prevention: Sustained Hemodynamically Stable Monomorphic VT Associated With Structural Heart Disease

- A - Appropriate
- M - May Be Appropriate

Benefits of Earlier VT Ablation, CAE Dec 2014

Table 1. Baseline Clinical Characteristics

Clinical Characteristics	All (N=300)	Group 1 (N=75)	Group 2 (N=84)	Group 3 (N=141)	*P* Value
Age, y	65±11.7	66.92±11.58	62.68±12.91	65.65±10.84	0.057
Sex	262 (87.3)	62 (82.7)	78 (92.9)	122 (86.5)	0.14
ICM	204 (68.0)	57 (76)	59 (70.2)	88 (62.4)	0.11
Arterial hypertension	211 (70.3)	56 (74.7)	52 (61.9)	103 (73)	0.13
Diabetes mellitus	111 (37.0)	26 (34.7)	28 (33.3)	57 (40.4)	0.50
Atrial fibrillation	117 (39.0)	27 (36.0)	31 (36.9)	59 (41.8)	0.63
Heart failure NYHA>II	146 (48.7)	28 (37.3)	41 (48.8)	77 (54.6)	0.054
Coronary artery bypass	101 (33.7)	30 (40)	21 (25)	50 (35.7)	0.10
ICD at admission	254 (84.7)	36 (48)	78 (92.9)	140 (99.3)	0.0001
Electrical storm	119 (39.7)	22 (29.3)	34 (40.5)	63 (44.7)	0.088
AAD at admission	133 (44.3)	27 (36.0)	36 (42.9)	70 (49.6)	0.43
Amiodarone	117 (39.0)	23 (30.7)	32 (38.1)	62 (44.0)	...
Class IB or C	11 (3.7)	3 (4.0)	3 (3.6)	5 (3.5)	...
Sotalol	5 (1.7)	0 (0)	2 (1.4)	3 (2.1)	...
Incessant VT	37 (12.3)	15 (20)	9 (10.7)	13 (9.2)	0.063
LVEF, %	32.6±11.1	35.60±13.31	32.57±10.75	31.01±9.75	0.016
High VT-burden	171 (57)	33 (44)	48 (57)	90 (63.8)	0.020

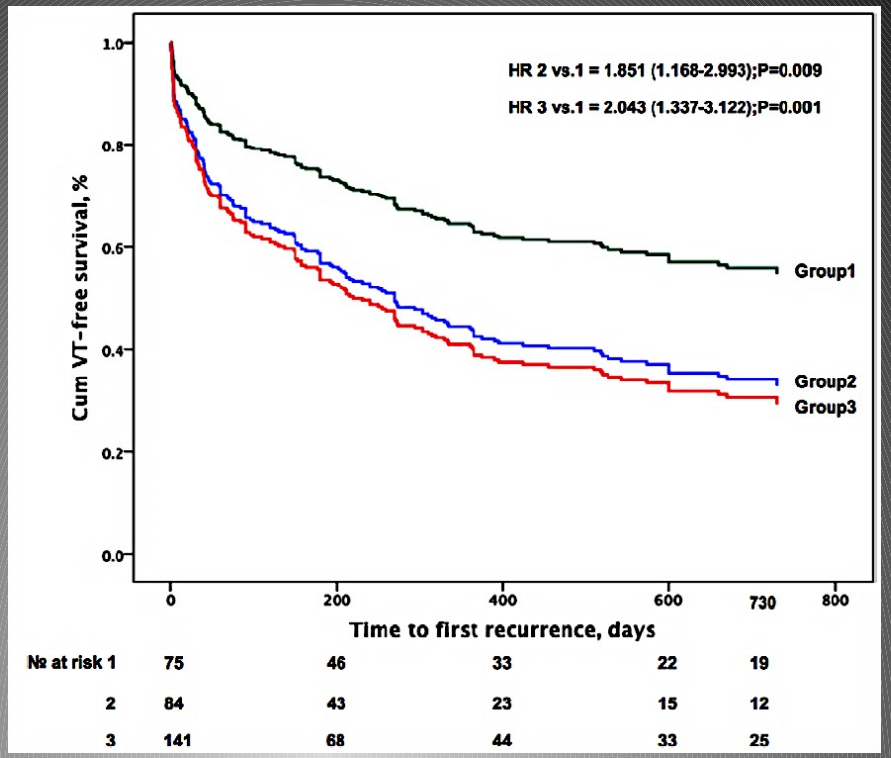


Table 3. Univariate and Multivariate Cox Regression Analysis of Ventricular Tachycardia Recurrence

	Univariate		Multivariate	
Variable	HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
Delayed vs early	1.85 (1.17–2.93)	0.009	1.95 (1.19–3.18)	0.007
Very late vs early	2.04 (1.34–3.12)	0.001	1.96 (1.24–3.09)	0.004
NIDCM	1.57 (1.16–2.14)	0.005	1.70 (1.11–2.60)	0.014
CABG	1.19 (0.82–1.53)	0.480	1.48 (1.02–2.14)	0.040
Absence of β-blocker	1.91 (1.21–3.03)	0.006	1.77 (1.05–2.98)	0.033
Complete success	1.59 (1.02–2.50)	0.042	1.54 (1.04–2.72)	0.032

CABG indicates coronary artery bypass grafting; CI, confidence interval; HR, hazard ratio; and NIDCM, nonischemic dilated cardiomyopathy.

Europace (2013) **15**, 167–169
doi:10.1093/europace/eus436

Current practice in Europe: how do we manage patients with ventricular tachycardia? European Heart Rhythm Association survey

Alessandro Proclemer[1]*, Nikolaos Dagres[2], Germanas Marinskis[3], Laurent Pison[4], Gregory Y.H. Lip[5], and Carina Blomstrom-Lundqvist[6], conducted by the Scientific Initiative Committee, European Heart Rhythm Association

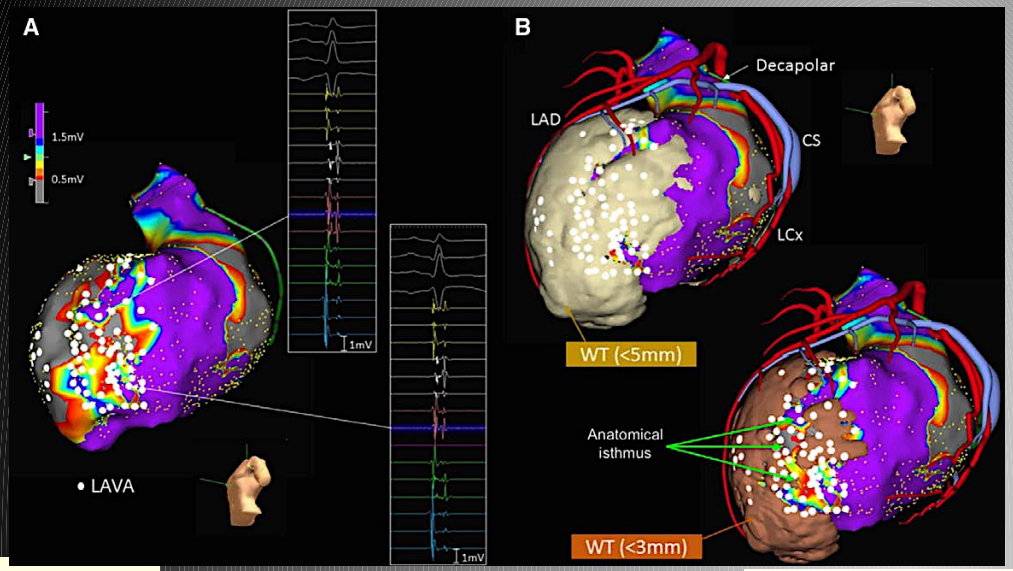
In secondary prevention patients, RFA of the VT was performed during the same hospitalization of ICD implantation in:

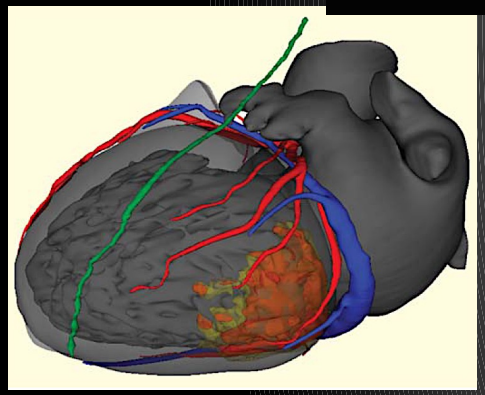
- 50% of the patients in 11.4% of centers
- 21 - 50% of patients 4.5% of centers
- 20% of the patients in 38.6% of centers

Why to perform VT ablation?

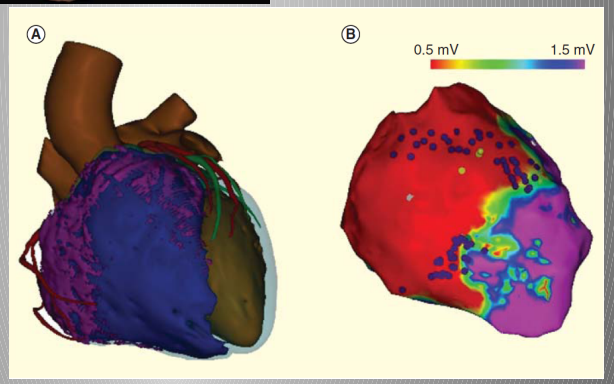
Electrophysiol. 2016 ; Expert Rev. Cardiovasc. Ther. 13(3), 263–276 (2015)

- Better understanding of anatomy barriers
- Better equipment (mapping, support machines)
- More experience





segmentation



Non-invasive imaging to define substrate ARVC

Table 1. Interventional measures in AES

Intervention	Methods	Reference
Sympathetic blockade	β-blocker therapy	Nademanee et al.[2]
	General anesthesia	Burjorjee et al.[3]
	Epidural anesthesia	Bourke et al.[4]
	Sympathetic denervation	Schwartz et al.[5]; Ajijola et al.[6]
	Renal denervation	Armaganijan et al.[7]
Ablation procedure	Endocardial	Carbucicchio et al.[8]
	Epicardial	Sacher et al.[9]
	Alternatives	Tokuda et al.[10]; Kumar et al.[11]
Hemodynamic support	ECMO	Chen et al.[12]
	LVAD	Abuissa et al.[13]; Thomas et al.[14]

AES, arrhythmic or electrical storm; ECMO, extracorporeal membrane oxygenation; LVAD, left ventricular assist device.

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Summary

- VT ablation is associated with high success rate
- A successful ablation may obviate the need for an ICD implantation
- Successful ablation reduces ICD interventions (so crucial)


Humor me

Ablation at the time of ICD implantation in secondary prevention patients? - Yes

The response

Table 1 Ongoing randomized VT ablation trials

Trial title	Ventricular Tachycardia Ablation versus Enhanced Drug Therapy	Does Timing of VT Ablation Affect Prognosis in Patients with an Implantable Cardioverter-Defibrillator?	Anti-arrhythmic Therapy vs Catheter Ablation as First Line Treatment for AICD Shock Prevention	Substrate Targeted Ablation Using the Cool Flex Irrigated Catheter Ablation System for the Reduction of Ventricular Tachycardia	Indian Trial of Endocardial Ventricular Substrate Ablation to Prevent Recurrent VT Events
Acronym	VANISH	PARTITA	AVATAR	STAR-VT	INTERVENE
Clinicaltrials.gov identifier	NCT00905853	NCT01547208	NCT02114528	NCT02130765	NCT02301390
Description	Compare ablation vs antiarrhythmic (amiodarone +/− mexiletine) for drug-refractory VT in post-MI patients	Two-part study: Part A: monitor all patients to assess whether NSVT or ATP is predictive of ICD shocks. Part B among patients with an ICD shock in Part A: compare ablation vs medical therapy	Single-center catheter ablation vs antiarrhythmic for appropriate ICD therapy	Substrate catheter ablation vs medical therapy	Compare ablation vs amiodarone in post-MI patients unable to afford an ICD
Estimated enrollment	260	590	40	1453	136
Study start date	May 2009	September 2012	June 2014	July 2014	October 2009
Estimated primary completion date	November 2015	September 2018	December 2016	July 2020	December 2016
Primary endpoint	1. Appropriate ICD shocks (5 years) 2. VT storm (5 years) 3. Death (5 years)	1. First appropriate ICD shock 2. No. of patients with worse CHF hospitalizations or death (2 years)	1. Appropriate ICD therapy (after 30-day treatment period)	1. No. of ICD shocks (appropriate and inappropriate)	1. All-cause mortality (2 years) 2. All-cause mortality, cardiac arrest, sustained VT
Secondary endpoints	1. All-cause mortality (5 years)	1. Cardiac death (2 years) 2. Electrical storm recurrences (2 years) 3. VT recurrences (2 years)	1. Composite safety endpoint: procedural complications; antiarrhythmic drug use, side effects, and discontinuation; death 2. Slow VT below detection threshold leading to hospitalization or requiring ablation 3. Mortality 4. Quality-of-life score 5. Healthcare resource utilization	1. No. of cardiovascular hospitalizations and CV-related ER visits	—
Inclusion criteria	Prior MI, ICD in *situ*, VT within 3 months (3 episodes ATP, 1 ICD shock, sustained VT below detection on ECG, 3 episodes VT in 24 hours), failed first-line antiarrhythmic	Part A: *ICD in situ* Part B: ICD *in situ* and status post ICD shock in Part A	ICD, CAD with prior MI, appropriate ICD therapy (>3 ATP or ≥1 appropriate shock)	St. Jude ICD or CRT-D (within 90 days of enrollment), history of spontaneous monomorphic VT or inducible VT during EP study	History of MI (≥1 month), patient unable to afford an ICD and has planned treatment with amiodarone

ATP = antitachycardia pacing; CAD = coronary artery disease; CHF = congestive heart failure; CRT-D = cardiac resynchronization therapy–defibrillator; CV = cardiovascular; EP = electrophysiologic; ER = emergency room; ICD = implantable cardioverter-defibrillator; MI = myocardial infarction; NSVT = nonsustained ventricular tachycardia; VT = ventricular tachycardia.

Ablation? Yes, but ablating what?

FIGURE 2 Burden of Ventricular Arrhythmias Before and After Renal Denervation

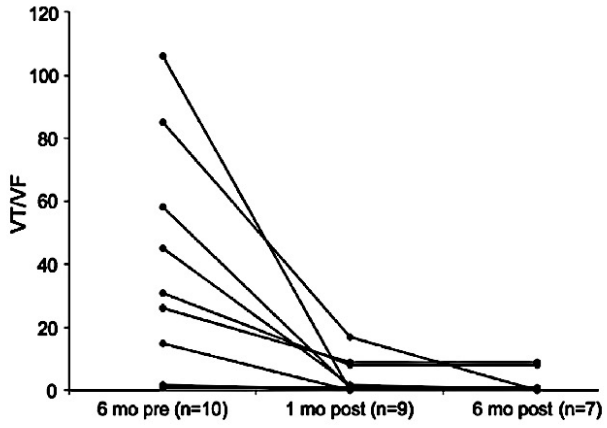

FIGURE 3 Number of ATP Therapies Before and After Renal Denervation

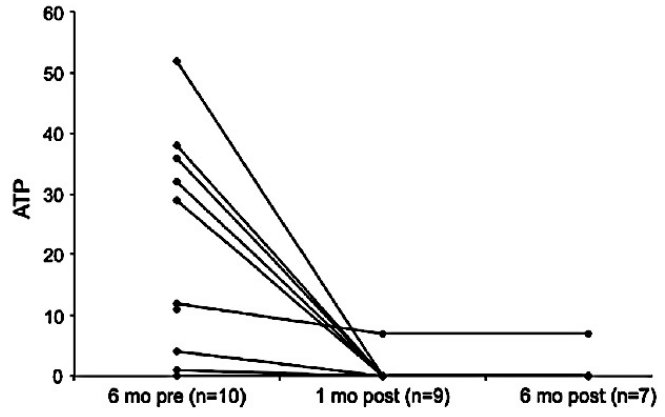

FIGURE 4 Number of Shocks Before and After Renal Denervation

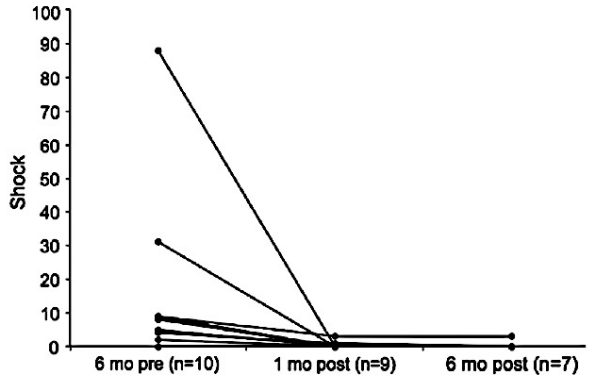

TABLE 2 Antiarrhythmic Medications at Baseline and at 6 Months of Follow-Up

Patient #	Medications	Dose at Baseline (mg)	Dose at 6 Months of Follow-Up (mg)
1	A, BB, L	600, 200, 300	400 (↓), 150 (↓), 0 (↓)
2	A, BB	900, 100	200 (↓), 100
3	A, BB, P	200, 50, 900	0 (↓), 50, 900
4	A, BB	600, 200	300 (↓), 100 (↓)
5	A	200	200
6	A, BB	600, 25	Death
7	A, BB	600, 25	200 (↓), 25
8	A, BB	600, 50	Death
9	A, BB	200, 100	200, 100
10	A, BB, L	600, 6.25, 300	Death

A = amiodarone; BB = beta-blocker; L = lidocaine; P = propafenone.

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Clinical Perspective

Radio frequency ablation for VT – A cost-effective tool to combat SCD in developing countries

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And we all will live happily ever after