

ADVANCES IN CARDIAC ARRHYTHMIAS

and

GREAT INNOVATIONS IN CARDIOLOGY

XXIX GIORNATE CARDIOLOGICHE TORINESI

TURIN
27-28
OCTOBER
2017

**WPW and Brugada syndrome:
what do they have in common?**

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WPW and Brugada

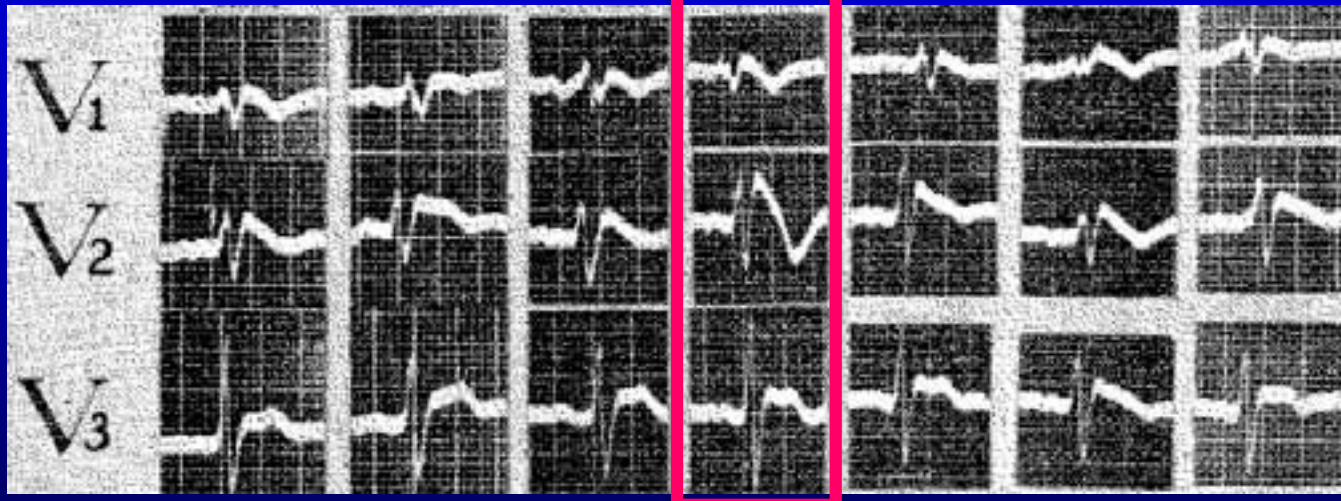
What do they have in common?



1. Electrocardiographic diagnosis, in anatomically normal heart

Wolff L, Osher HL, 1953

Described the 1° ECG with Brugada pattern



A 39-year-old man with no clinical evidence of heart disease.

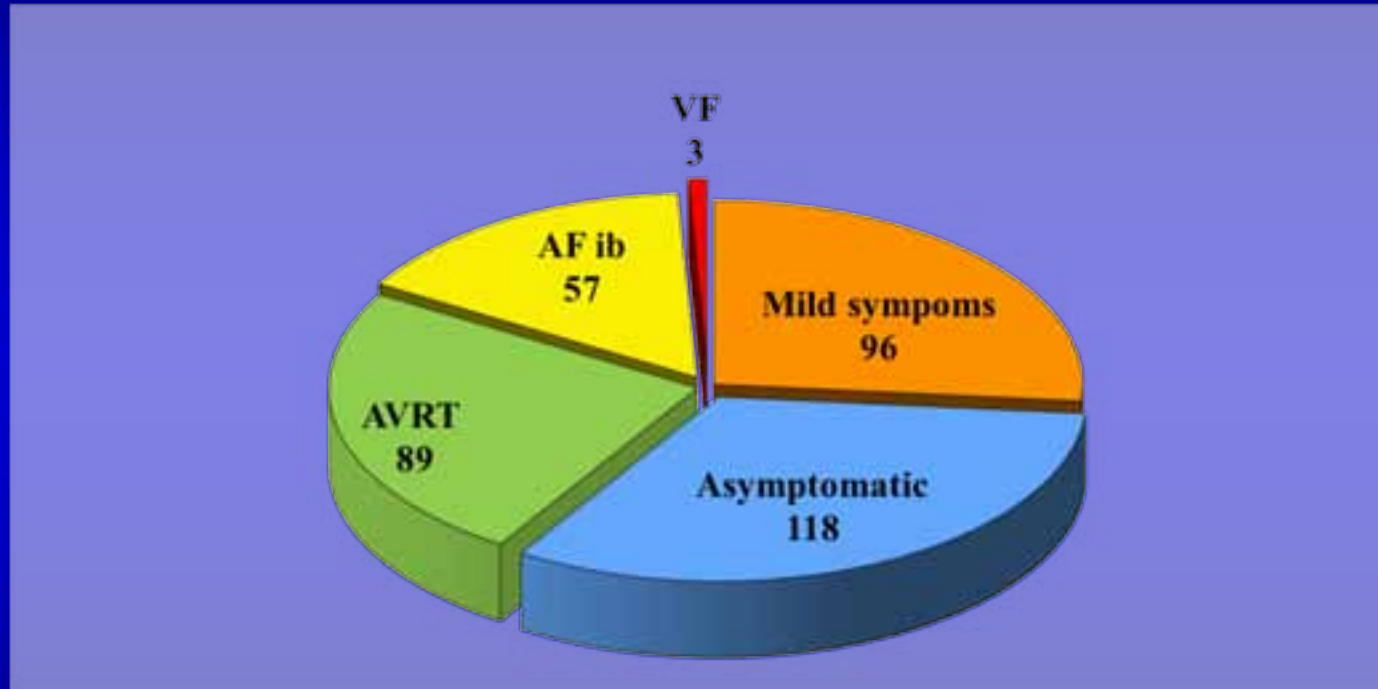
WPW and Brugada

What do they have in common?



- 1. Electrocardiographic diagnosis, in anatomically normal heart**
- 2. Once the diagnosis has been made, these patients have a low mortality rate, but the first event may be sudden cardiac death**
- 3. EPS can be helpful in stratifying the risk of sudden death**
- 4. Both of them have a substrate target for catheter ablation**

Risk of death in 363 WPW patients 1982-1992



Associated cardiopathies in 12 patients (3.3%)

3 patients died, 1 of SD, **0.03 per 100 person-year**

Natural history of 1642 pts with WPW

Authors	Berkman et al NEJM '68	Leitch et al Circulation '90	Klein Am J Cardiol 1989	Munger Circulation '93	Inoue Herat '00	Goudevenos Heart '00	Fitzsimmons Am Heart J '01	Sarubbi Heart '03	Pappone JACC '03	Santinelli JACC '09	Gaita Circulation '95 (abstr)

COMPLICATIONS OF TC ABLATION OF WPW

	Pts	Complications	Tamponade	AV block	Stroke	Death
Total	9125	218 (2.4%)	32 (0.32%)	30 (0.30%)	24 (0.26%)	0.08%
with SCD	5	0	0	2	0	0

SCD: 9/1642 pts 0.5 %

Mean SCD per year 0.03%

SCD was the first event 60%

SCD %	2,34%	0%	0%	1,77%	0%	0%	0,42%	1,02%	0,47%	0%	0,28%
SCD % year	0,12%	0%	0%	0,15%	0%	0%	0,02%	0,26%	0,15%	0%	0,03%

Brugada Piedmont Prospective Registry

2001-2016



826 pts → 12 diagnosed after Sudden Death

total 814 pts

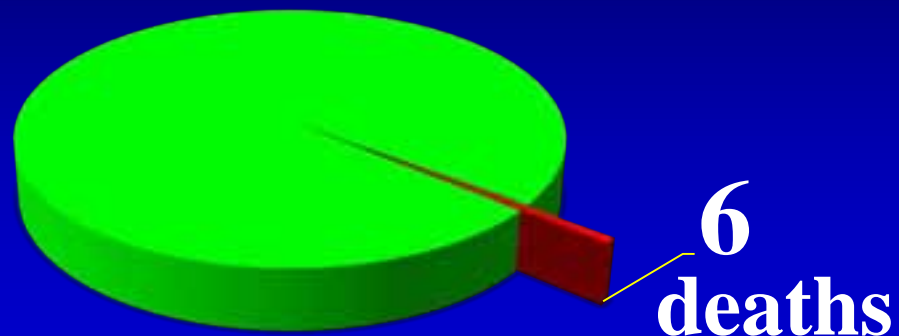
Participants



- Torino
- Alessandria
- Asti
- Cuneo
- Novara
- Orbassano
- Pinerolo
- Rivoli
- Vercelli

Deaths in the Brugada Piedmont Registry:

814 pz f-up from 2001-2016



3 NOT Brugada related:

- 1 myocardial infarction
- 1 cancer
- 1 old age

3 sudden deaths

Sudden Deaths 3/814
0.07% events-year

WPW
0.03 %

How we treated ALL the patients with Brugada ECG pattern

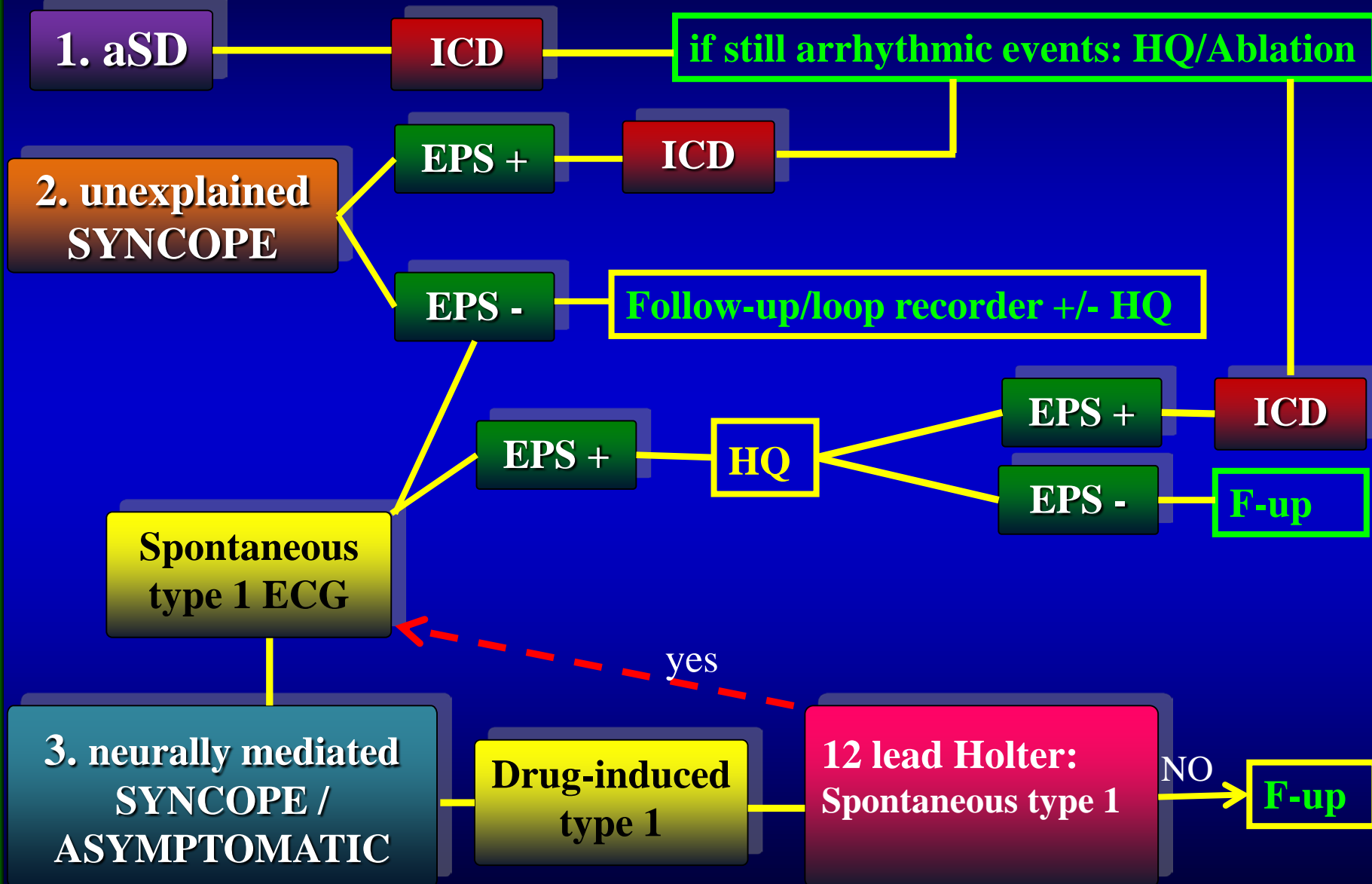
Avoid drugs that may increase the ST segment elevation www.brugadadrugs.org

Drug-Induced Brugada-Like ECG Patterns	Psychotropic drugs
Antiarrhythmic drugs	Tricyclic antidepressants ²¹⁸
Na ⁺ channel blockers	Amitriptyline, ^{217,218} Nortriptyline, ¹⁵¹ Desipramine, ¹⁴⁹ Clomipramine ¹⁵⁰
Class IC drugs (Flecainide, ^{12,15,142,207,208} Pilsicainide, ^{148,209} Propafenone ²¹⁰)	Tetracyclic antidepressants
Class IA drugs (Ajmaline, ^{12,211} Procainamide, ^{12,13} Disopyramide, ^{4,13} Cibenzoline ^{212,213})	Maprotiline ²¹⁷
Ca ²⁺ channel blockers	Phenothiazine
Verapamil	Perphenazine, ²¹⁷ Cyamemazine.
β -Blockers	Selective serotonin reuptake inhibitors
Propranolol intoxication ²¹⁴	Fluoxetine ²¹⁸
Antianginal drugs	Lithium ¹⁵⁷
Ca ²⁺ channel blockers	Other drugs
Nifedipine, diltiazem	Histaminic H1 receptor antagonists
Nitrate	Dimenhydrinate ¹⁵²
Isosorbide dinitrate, nitroglycerine ²¹⁵	Diphenhydramine ²¹⁹
K ⁺ channel openers	Cocaine intoxication ^{153,220}
Nicorandil	Alcohol intoxication

Modified from Antzelevitch et al.⁵⁶ and Shimizu²²¹ with permission

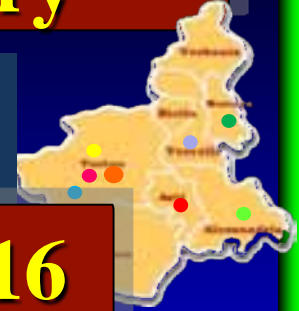
Promptly treat fever

How we treated Brugada patients



Brugada Piedmont Prospective Registry

826 pts → 12 diagnosed after Sudden Death

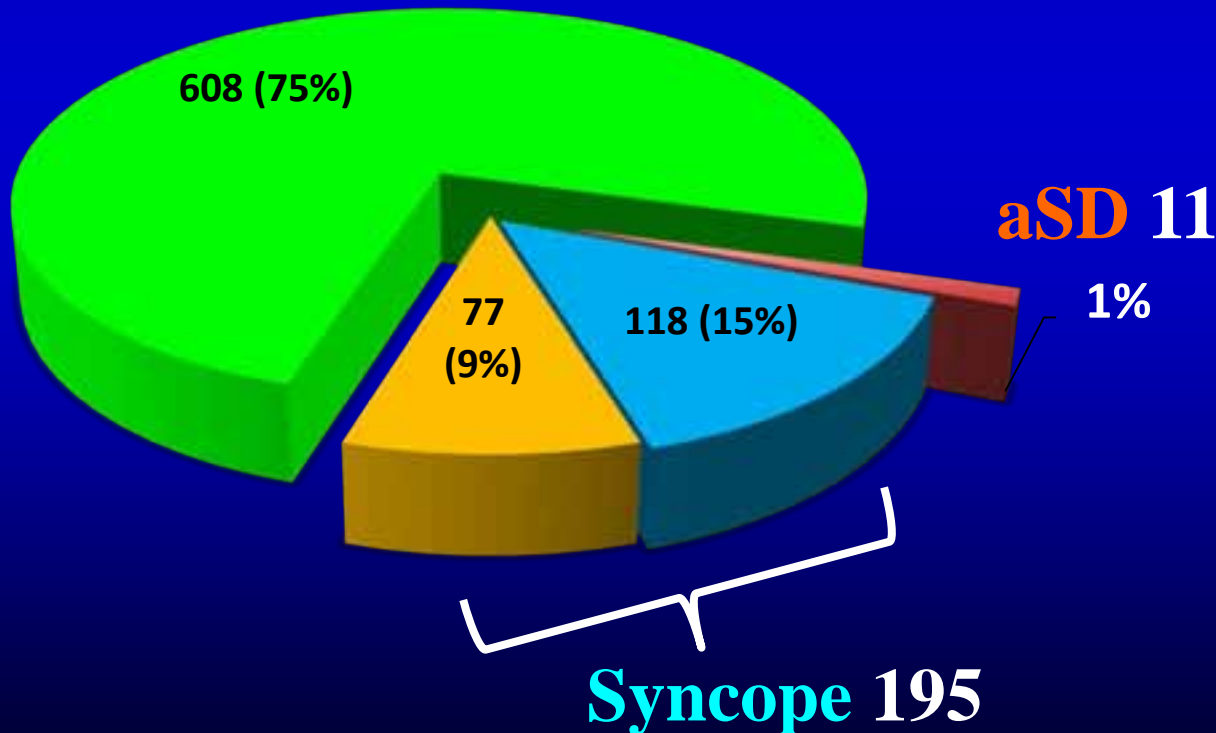


total 814 pts

2001-2016

Symptoms at presentation

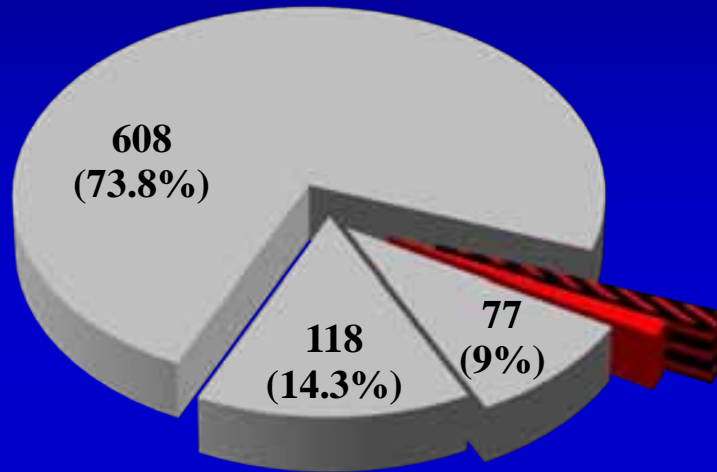
Asymptomatic 608



Brugada Piedmont Registry 2001-2016



pts with history of SD 23 (2.9%)



■ 12 (52%) diagnosed after SD

■ 11 aborted SD

10 ICD

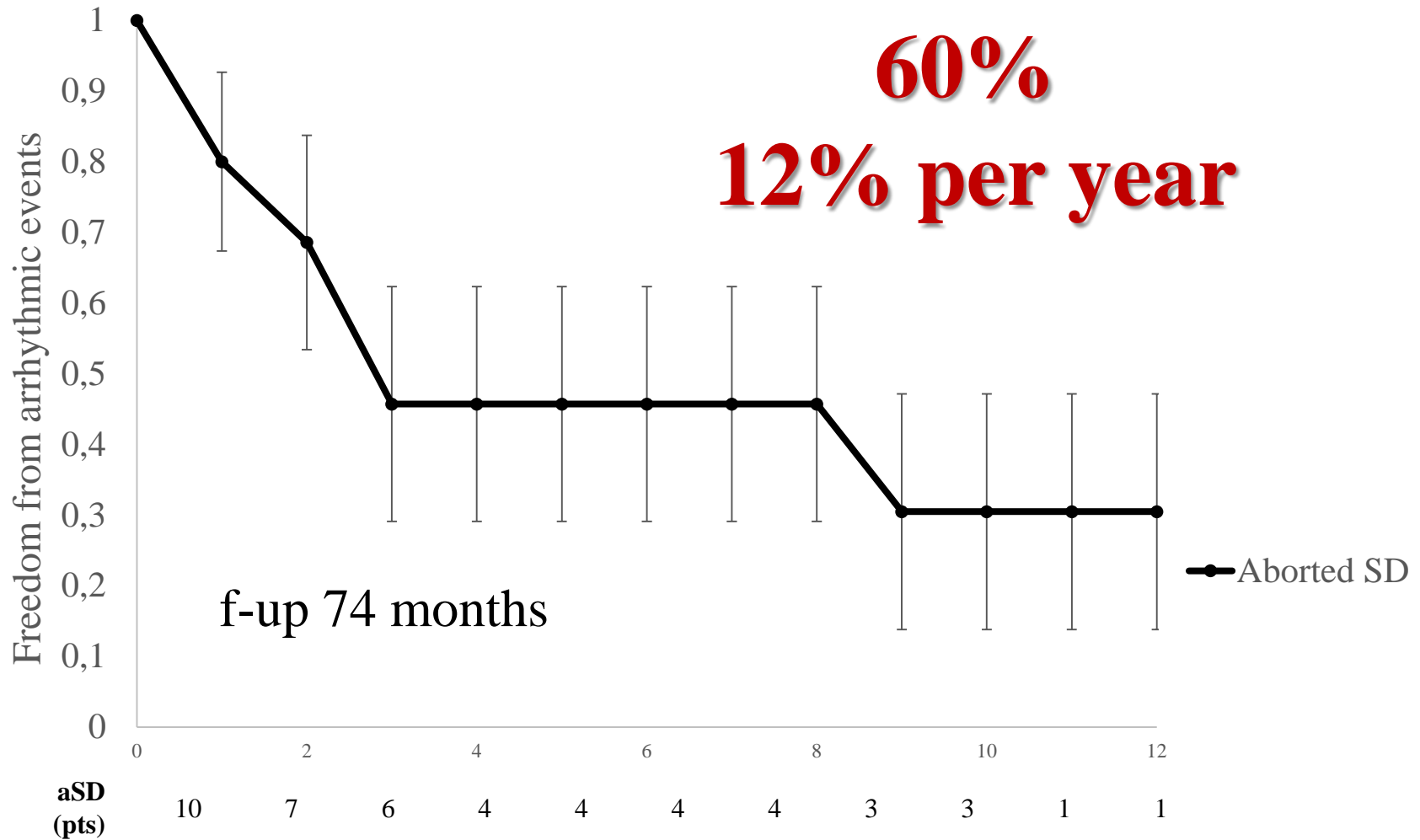
1 child → HQ and loop recorder

follow-up 74 ± 45 months



NO DEATHS

Arrhythmic events in pts with aSD

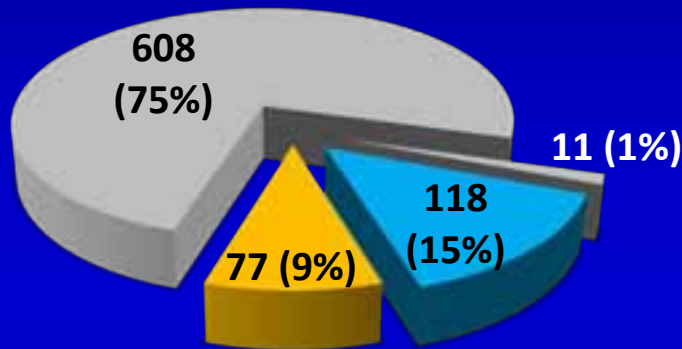


Brugada Piedmont Registry 2001-2016



pts with Syncope

f-up 74 ± 45 m



Syncope: 195 (24%)

77 unexplained syncope

**53 (69%)
ICD**

**16 (21%)
HQ + Loop**

**118 neurally mediated
syncope**

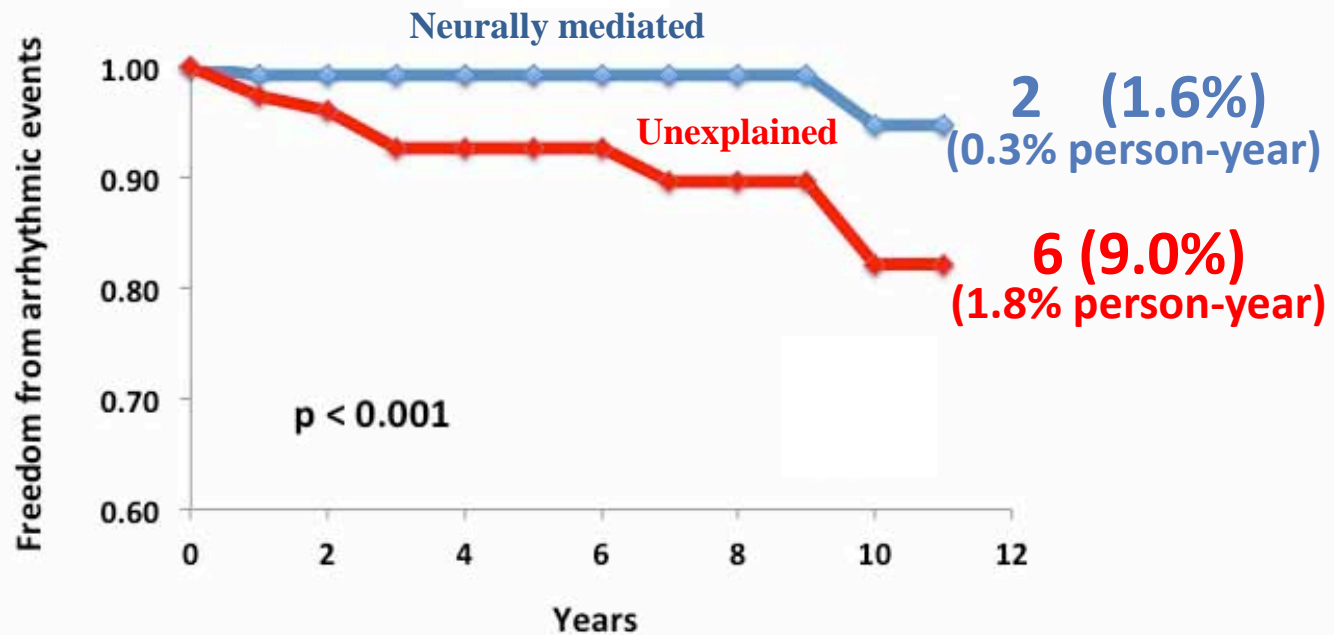
**23 (19%)
ICD**

**20 (17%)
HQ + Loop**

But... again, NO DEATHS

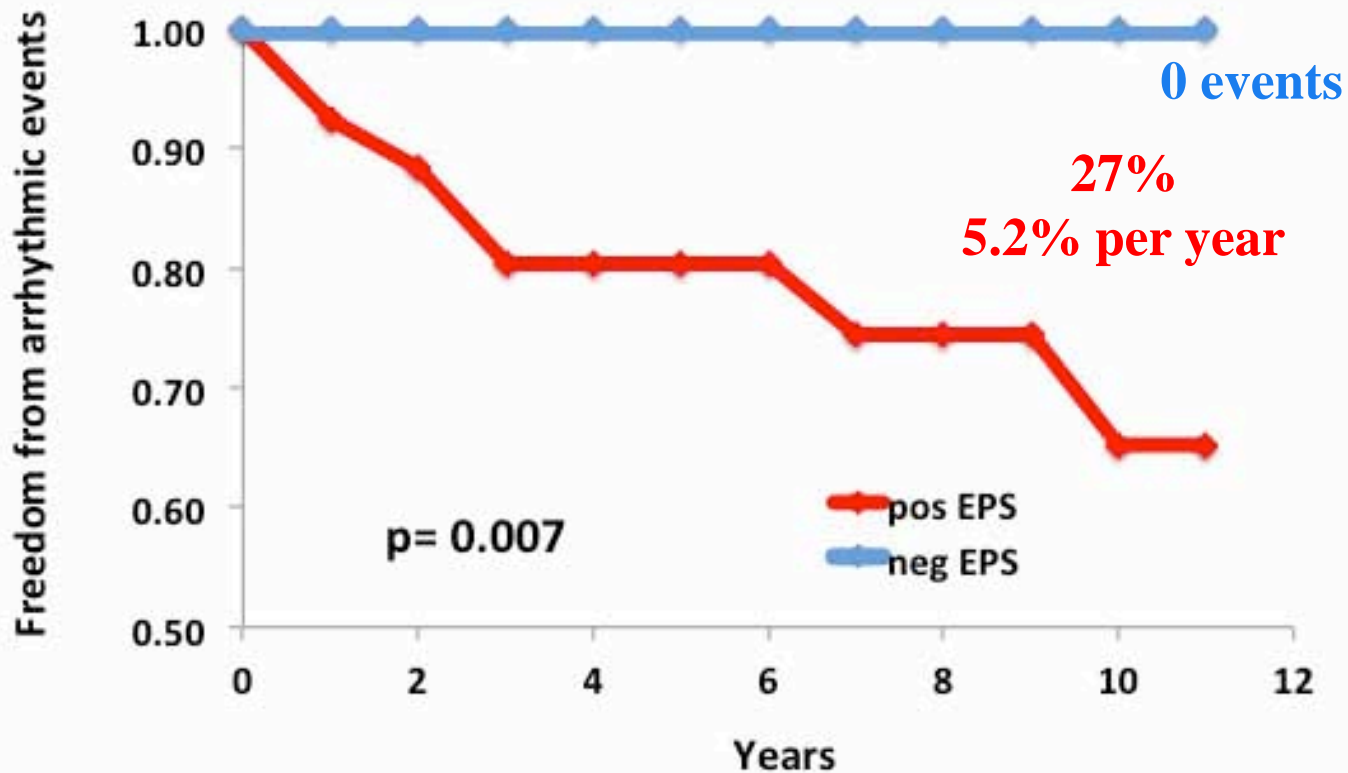
Arrhythmic events in pts with Syncope

118 neurally-mediated vs 77 unexplained syncope



G1	118	97	78	64	50	39	33	28	23	22	18
G2	77	68	59	49	42	37	30	26	19	12	9

Role of **EPS** in pts with UNEXPLAINED SYNCOPES

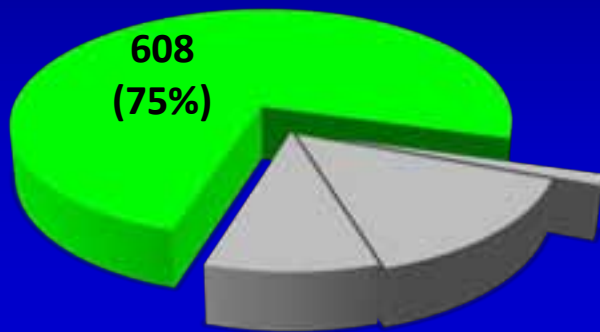


pos EPS	26	23	22	20	17	15	14	13	11	8	7
neg EPS	31	28	22	17	14	14	10	8	5	3	2

Brugada Piedmont Registry 2001-2016

in Asymptomatic pts

f-up 74 ± 45 m



Asymptomatic pts: 608

This means that we have stratified and treated properly the symptomatic patients, but we still have to improve risk stratification and treatment of the asymptomatic patients

3 DEATHS

+ 3 events ICD

Can ablation improve these results?

Prevention of Ventricular Fibrillation Episodes in Brugada Syndrome by Catheter Ablation Over the Anterior Right Ventricular Outflow Tract Epicardium

Koonlawee Nademanee, MD; Gumpanart Veerakul, MD; Pakorn Chandanamattha, MD; Lertlak Chaothawee, MD; Aekarach Ariyachaipanich, MD; Kriengkrai Jirasirojanakorn, MD; Khanchit Likittanasombat, MD; Kiertijai Bhuripanyo, MD; Tachapong Ngarmukos, MD

Circulation 2011, 123: 1270-79

Brugada Syndrome Phenotype Elimination by Epicardial Substrate Ablation

Josep Brugada, MD*; Carlo Pappone, MD, PhD*; Antonio Berruezo, MD, PhD; Gabriele Vicedomini, MD; Francesco Manguso, MD, PhD; Giuseppe Ciconte, MD; Luigi Giannelli, MD; Vincenzo Santinelli, MD

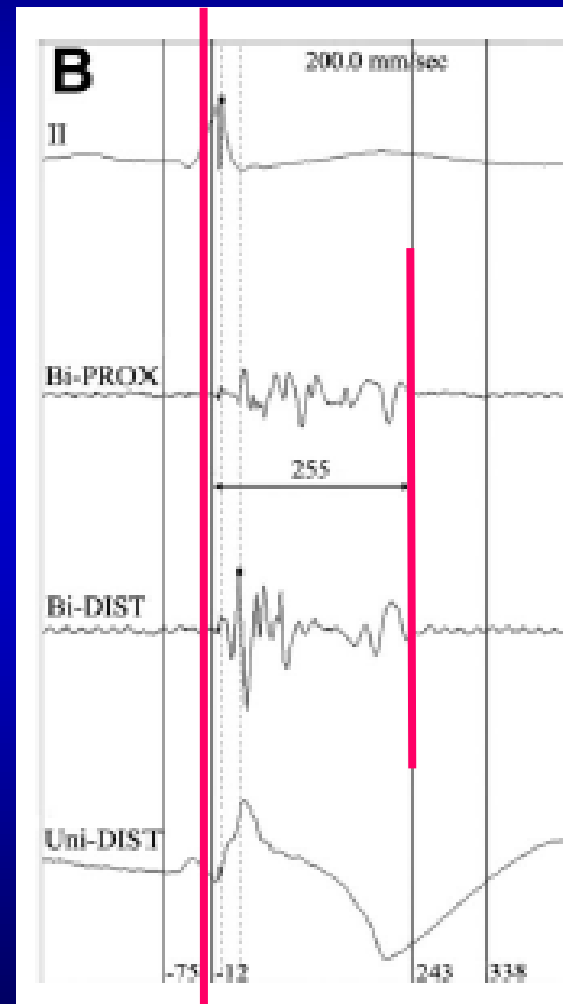
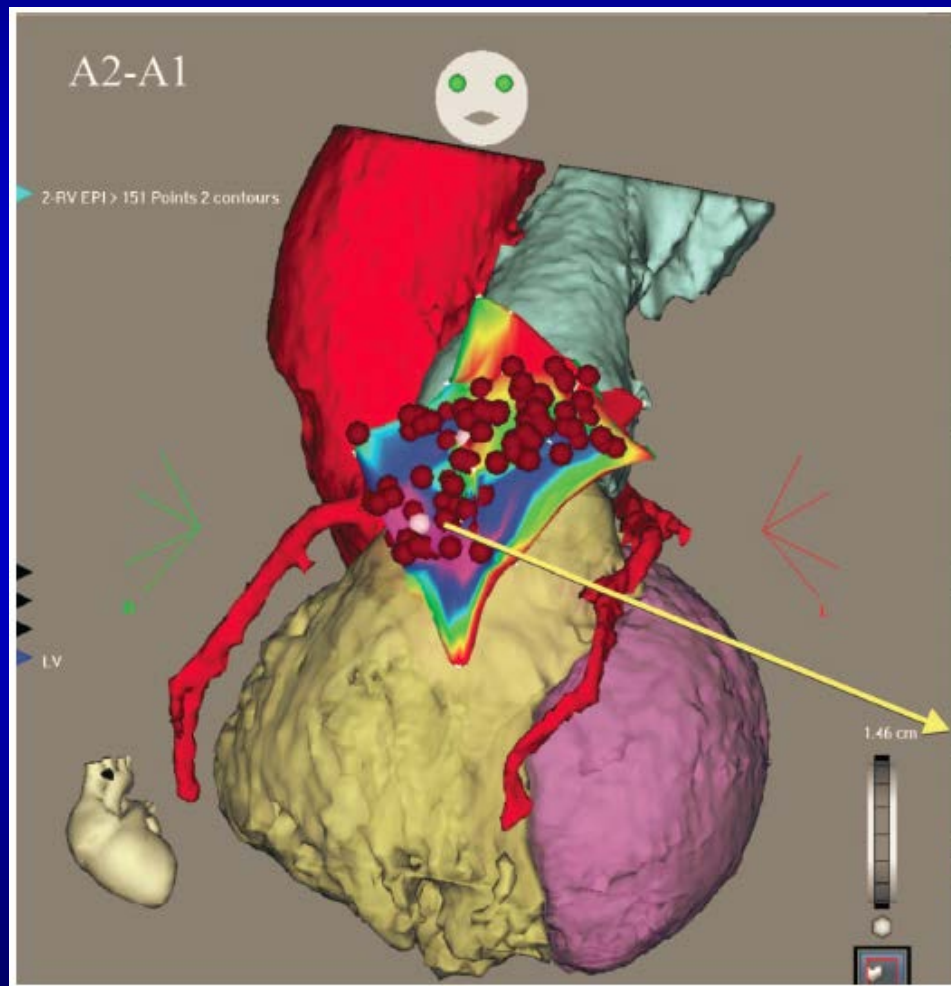
Brugada, circ arrh el 2015

9 Brugada
ICD patients

*2-6 shock
previous month*

RVOT mapping,
endo and
epicardial

**Low and
fractionated
potentials**



RF epicardial ablation

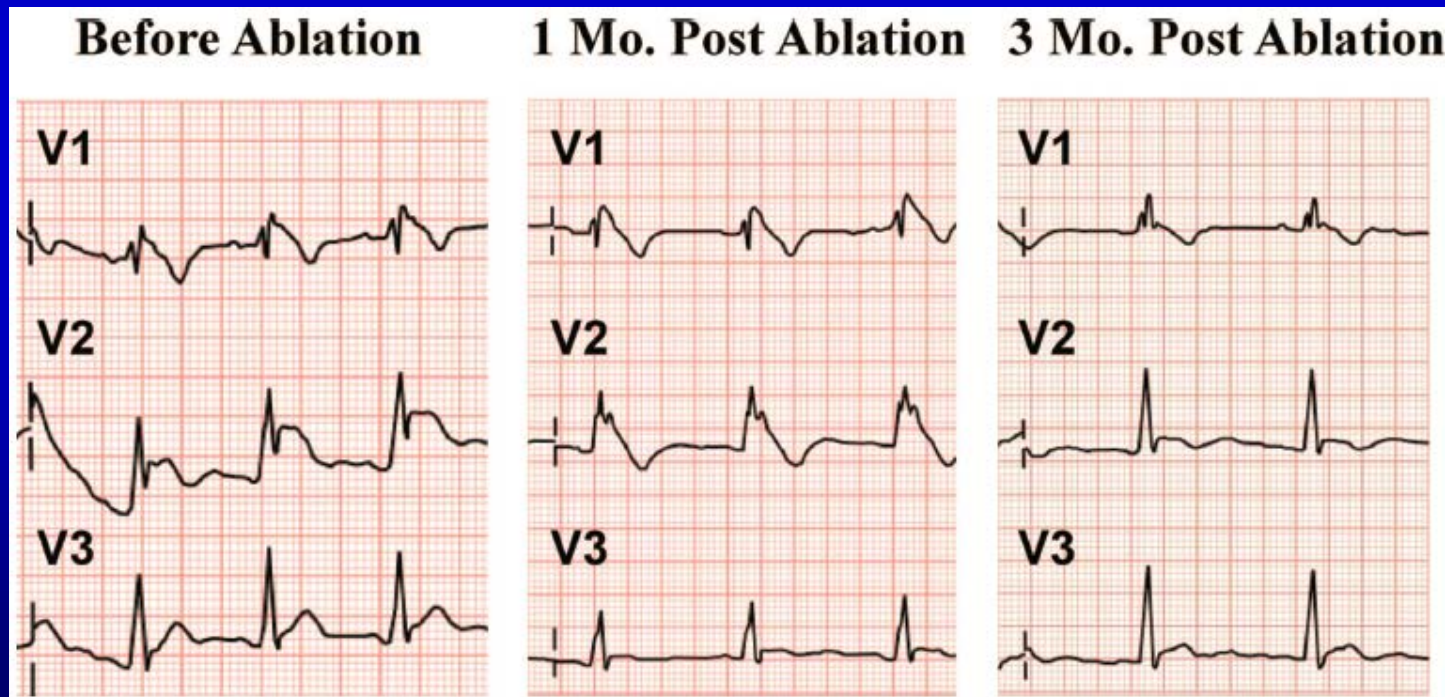
Fragmented
potential
abolition

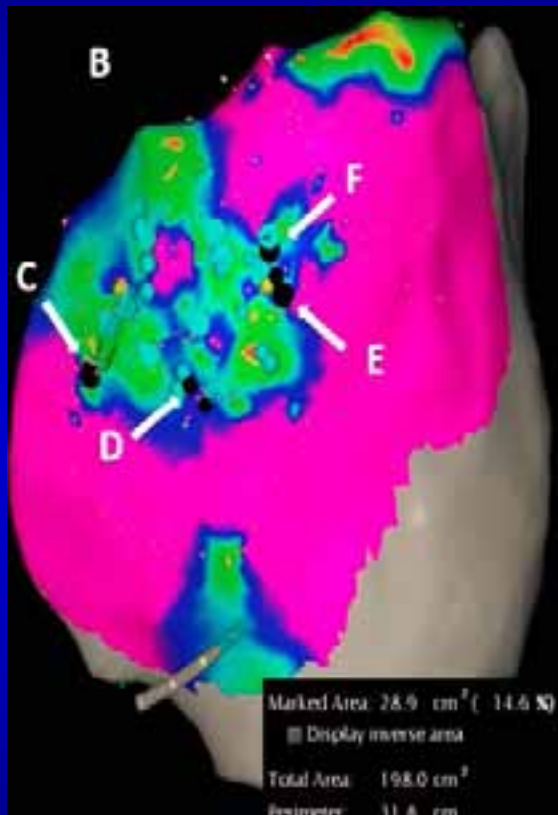
Complications: 2 pericarditis, resolved spontaneously in 1 week

2 years
followup

1 VF recurrence

Progressive ECG
normalization





RVOT areas of low and fractionated potentials

Area dimension increased after flecainide

17.6 cm² → 28.5 cm²

Brugada pattern

Before Ablation

Basal

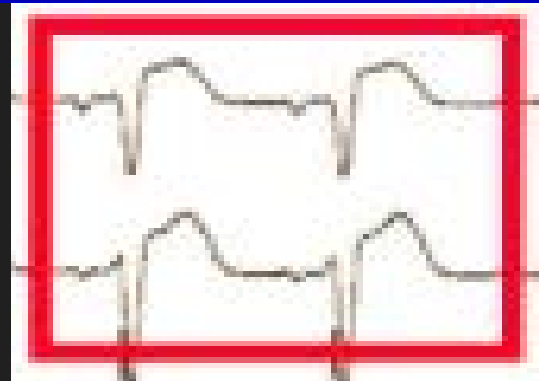
After flecainide

Immediately After Ablation

Basal



After flecainide



During Followup

Basal



After flecainide



50-year-old patient with history of aborted sudden death

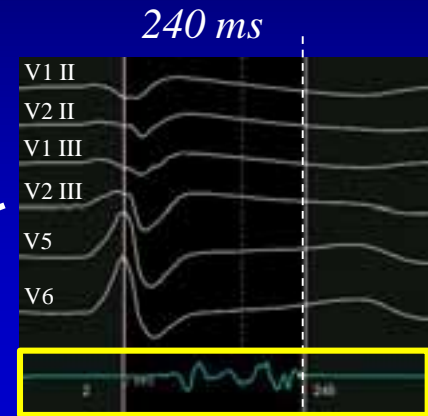
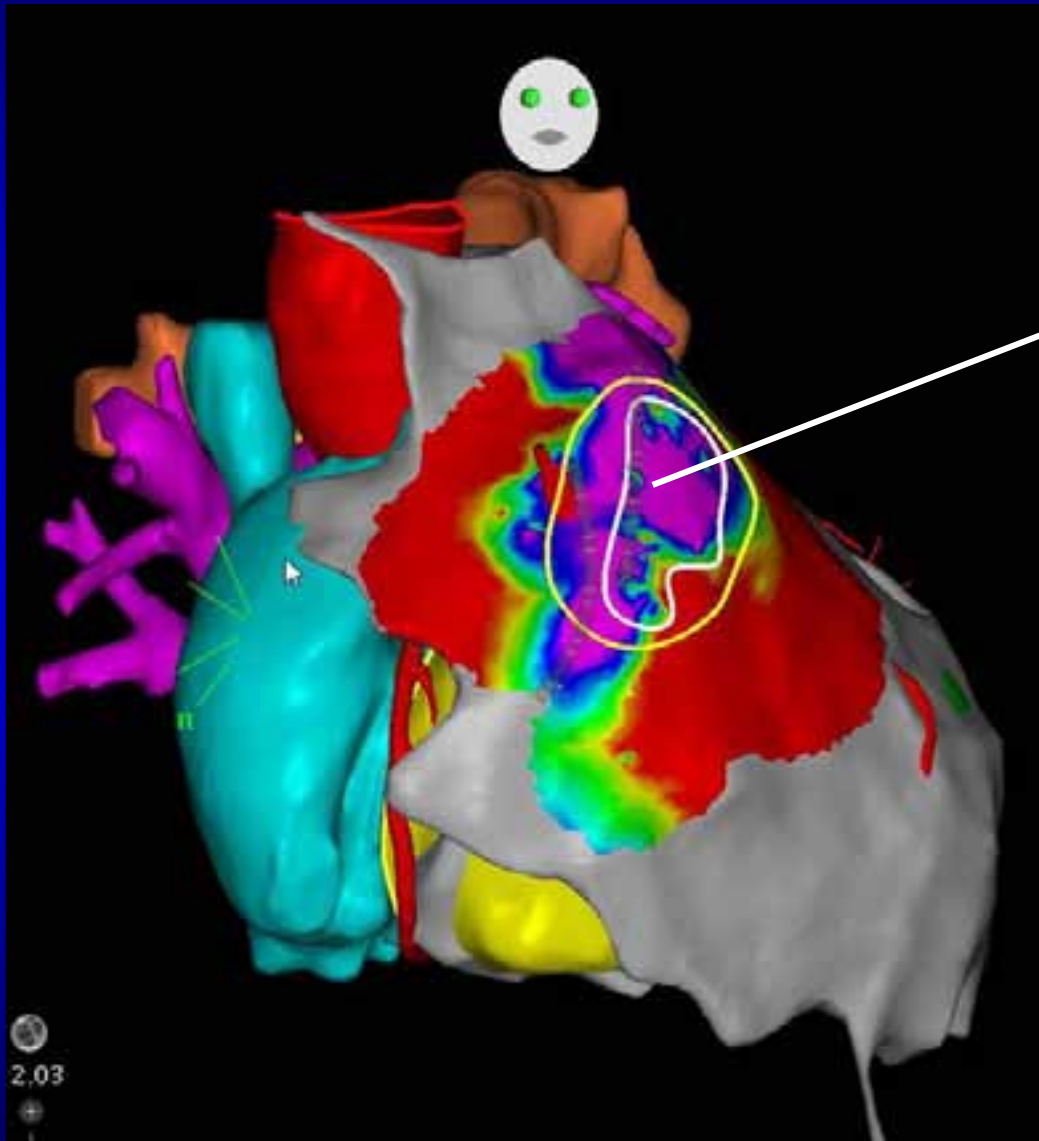
ECG h. 8.00



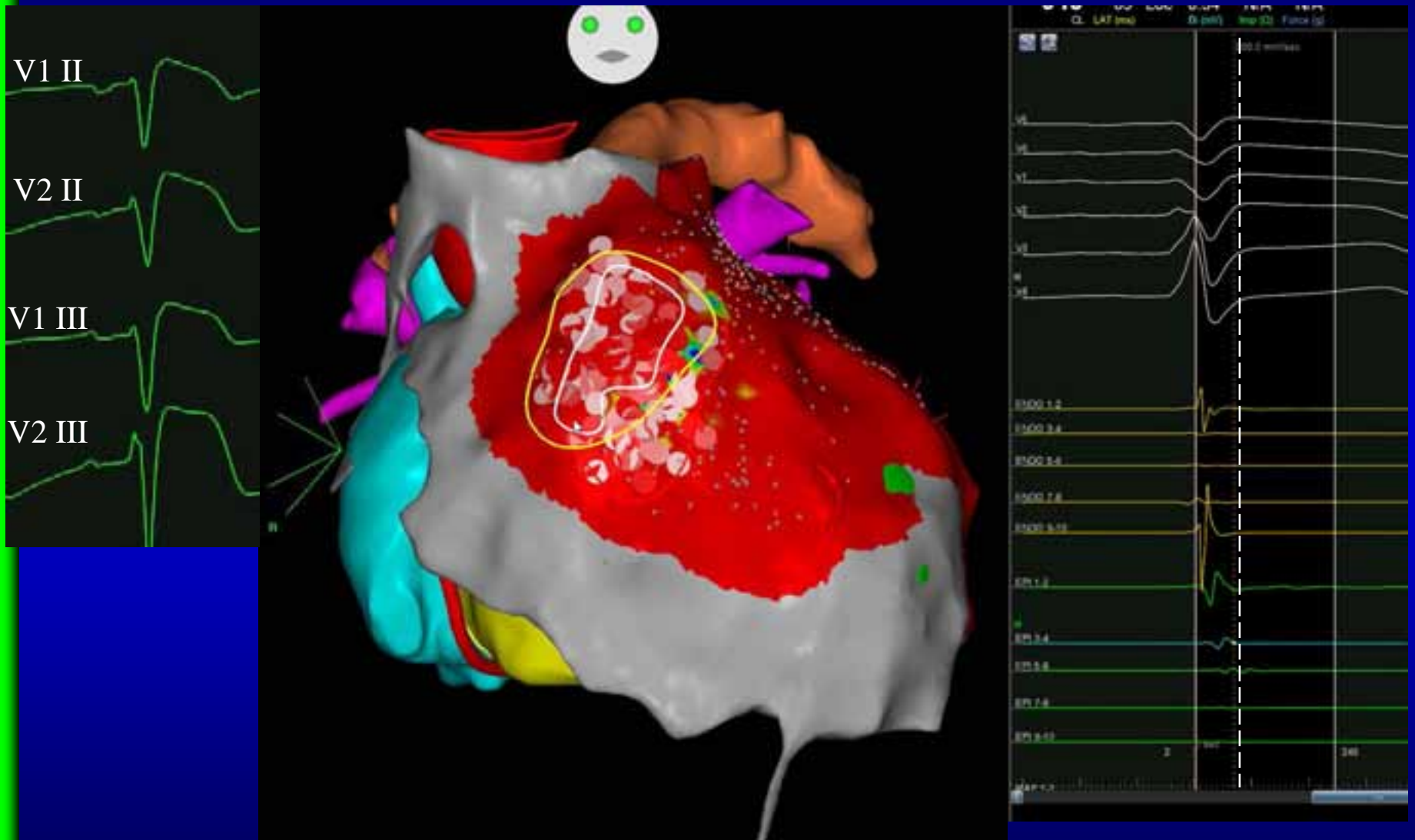
ECG h. 14.00



Ajmaline infusion



After radiofrequency ablation



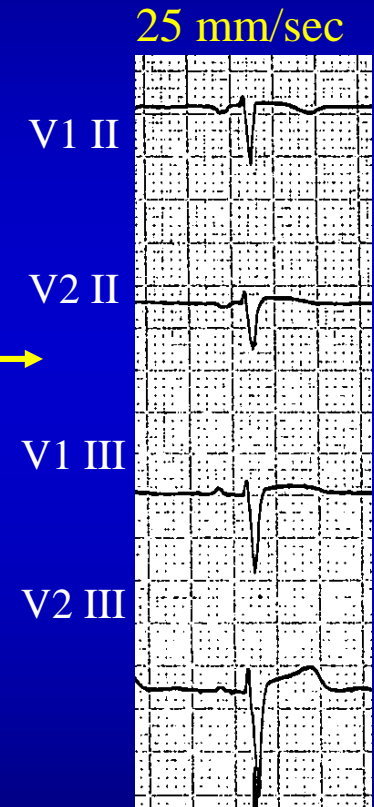
Basal ECG



Post Ablation



1 month FU



Catheter ablation in Brugada patients

Catheter ablation may be considered in patients with a history of electrical storms or repeated appropriate ICD shocks.

IIb

C



My point of view

Ablation should be considered in all patients with a single appropriate ICD shock

Conclusions

Patients with Brugada syndrome, as in WPW syndrome, have low risk of death if correctly treated.

EPS can be helpful to stratify risk in both syndromes.

Ablation is curative in WPW patients, while in Brugada syndrome doesn't replace ICD yet.

We need randomized studies before considering ablation as an alternative to ICD implantation, or to enlarge the indication to asymptomatic patients.

Thank you for your attention

