XIX CONGRESSO NAZIONALE ANCE

10-13 Ottobre 2019
Hilton Sorrento Palace
Sorrento (NA)

LA RIPOLARIZZAZIONE PRECOCE NELLO SPORTIVO E DIAGNOSI DIFFERENZIALE: le novità nei protocolli cardiologici per il giudizio di idoneità allo sport agonistico 2017

Maurizio Contursi
Cardiologia dello Sport -Check Up - SA

CONFINE SOTTILE TRA NORMALITA' E PATOLOGIA

GLI ADATTAMENTI CARDIOVASCOLARI DELL' ATLETA RAPPRESENTANO, A VOLTE ,UNA SOTTILE LINEA DI CONFINE TRA LA FISIOLOGIA E LA PATOLOGIA E RENDONO DIFFICILE UNA VALUTAZIONE DEL RISCHIO. SE QUESTA E' UNA DIFFICOLTA' OBIETTIVA, AMPLIFICATA DAL RISALTO MEDIATICO DI SEPPUR RARE FATALITA' DURANTE IL GESTO SPORTIVO, ESISTONO ANCHE CONTESTI CLINICI MENO PUBBLICI, QUOTIDIANI E NON ESENTI DA DIFFICOLTA' DIAGNOSTICHE .

SERVONO QUINDI STRUMENTI DI CONOSCENZA ,DI ESPERIENZA ,DI RIGORE SCIENTIFICO , UNITAMENTE ALL' IRRINUNCIABILE BUON SENSO , PER UNA VALUTAZIONE CLINICA SERENA

Nella maggioranza dei casi l'ECG dello sportivo non è distinguibile da quello dell'atleta sano

ECG Abnormalities in the Athlete

Common ECG patterns (up to 80%)*	Uncommon ECG patterns (<5%)†
•Sinus bradycardia; •First degree AV block; •Notched QRS in V1 or incomplete RBBB; •Early repolarization; •Isolated QRS voltage criteria for left ventricular hypertrophy	•T-wave inversion; •ST-segment depression; •Pathological Q waves; •Left atrial enlargement; •Left axis deviation/left anterior hemiblock; •Right axis deviation/left posterior hemiblock; •Right ventricular hypertrophy; •Complete LBBB or /RBBB; •Long or short QT interval; •Brugada-like early repolarization; •Ventricular arrhythmias

Corrado D, McKenna WJ: Eur Heart J 2007 ;28:1920-2

Caso Clinico

- Giovane calciatore agonista di 20 anni
- D'estate, su una spiaggia della litoranea cilentana, dopo una partitella di calcio sul bagnasciuga, nel raggiungere l'ombrellone , improvvisamente si accascia privo di sensi
- Un medico presente inizia la RCP con parziale ripresa dello stato di coscienza !
- Dopo 10 min circa viene prelevato da una ambulanza medicalizzata
- La prima scarica di defibrillazione avviene in PS dopo circa 30' di RCP

20 a, m, calciatore, agonista

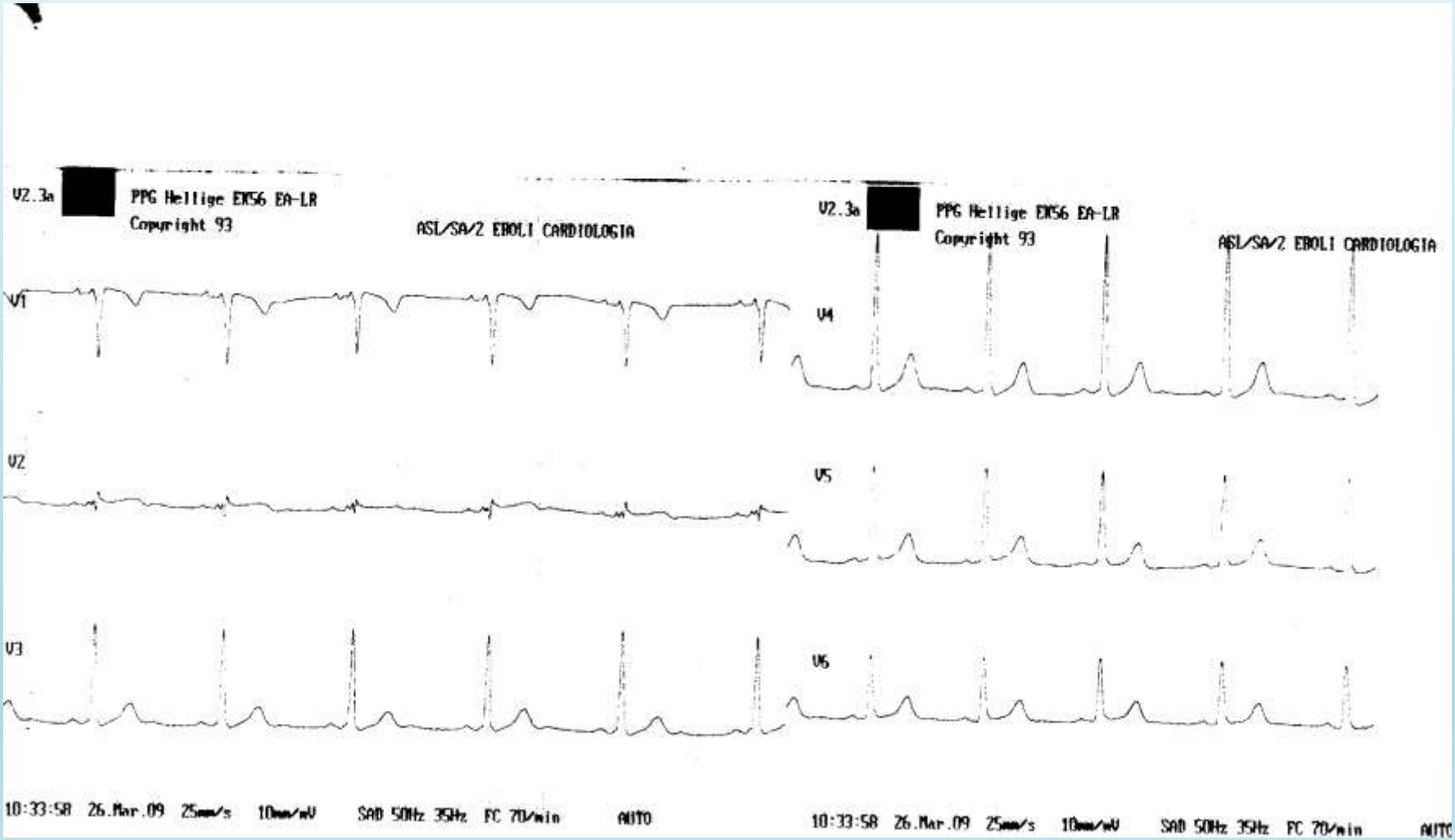
Francesco torna a vivere
Il suo cuore fermo un'ora

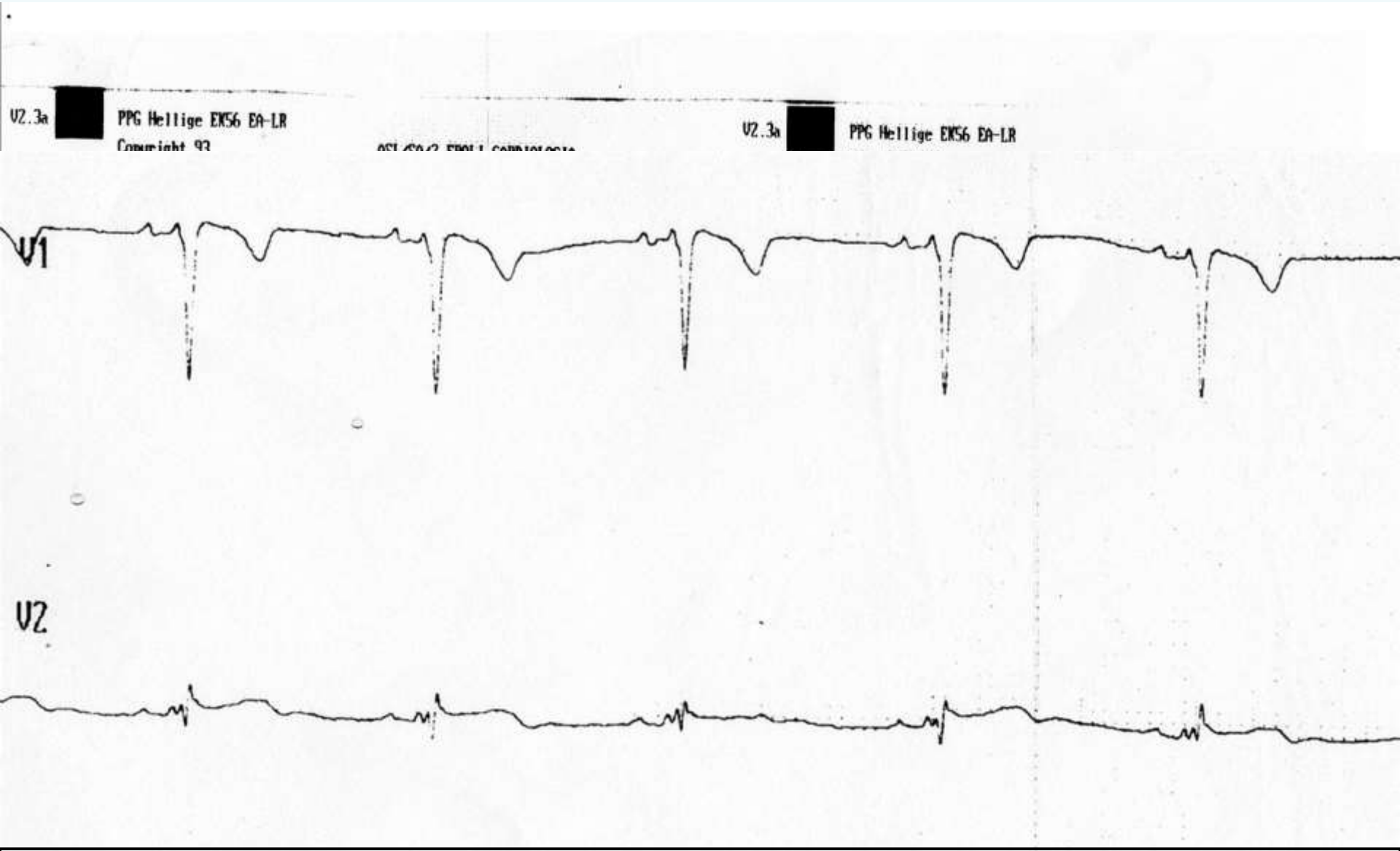
La storia del 22enne diventata un caso
da manuale clinico a livello internazionale

ECO, RMN, CORO: normali
diagnosi: Fibrillazione Ventricolare Idiopatica

A POSTERIORI...

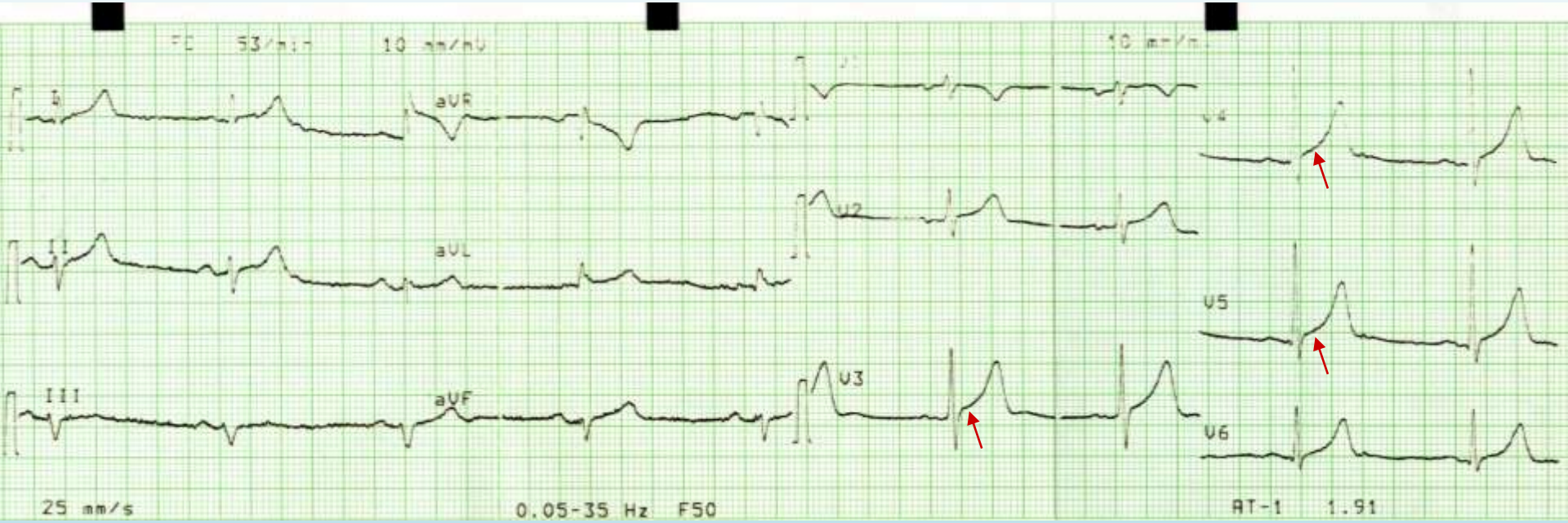
M.B. sesso maschile anni 20 – ac durante partita di calcio in spiaggia





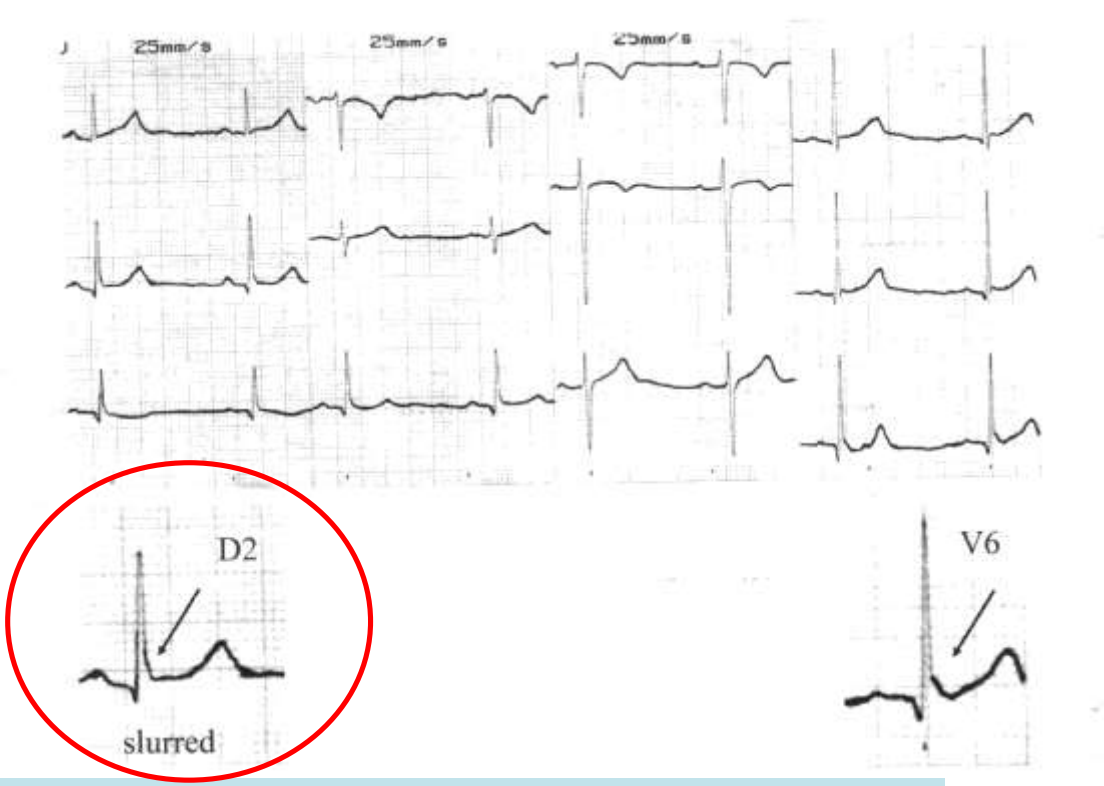
Sindrome dell’onda J ?

Pattern di Ripolarizzazione Precoce (ERP)



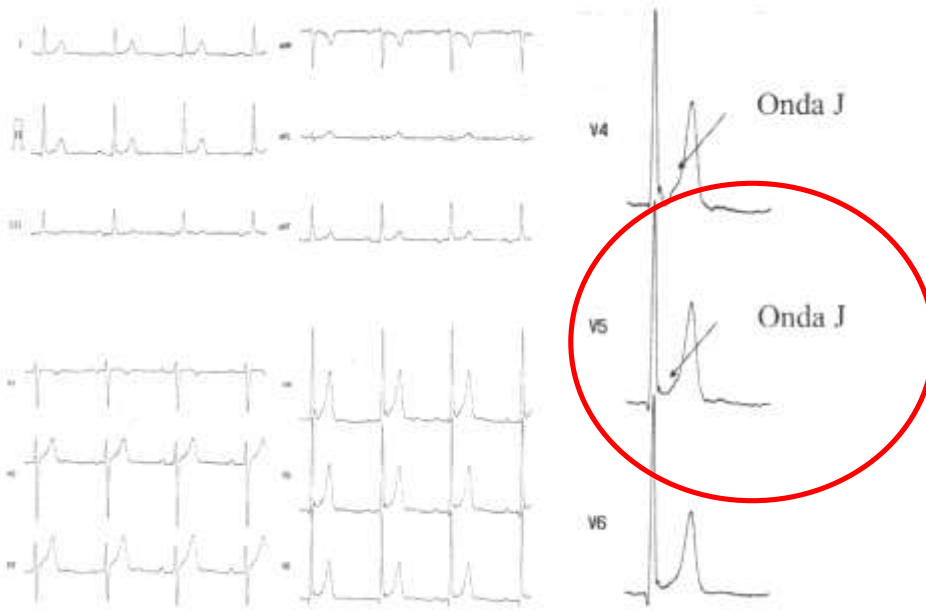
La **ERP** è caratterizzata dall'innalzamento del punto J (giunzione tra QRS e ST) di almeno 0,1 mV dalla linea di base, associata a notching o slurring della parte terminale del QRS che può variare di sede, morfologia e grado

E' la regola piuttosto che l'eccezione tra gli atleti di alto livello (50% – 80%)



Atleta di resistenza.
RVP con slurred terminale

Atleta di resistenza:
Onda J



Clinical significance of Early Repolarization (J-wave/QRS slurring)

Several contemporary observations suggest that early repolarization pattern (J-wave/QRS slurring) may be malignant in humans (i.e., associated with idiopathic ventricular fibrillation).

Gussak I and Antzelevitch C, J Electrocardiology 2000;

Tagaki M et al. J cardiov Electrophysiol 2000;

Haissaguerre et al. NEJM 2008;

Antzelevitch C. Heart Rhythm 2010;

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Sudden Cardiac Arrest Associated with Early Repolarization

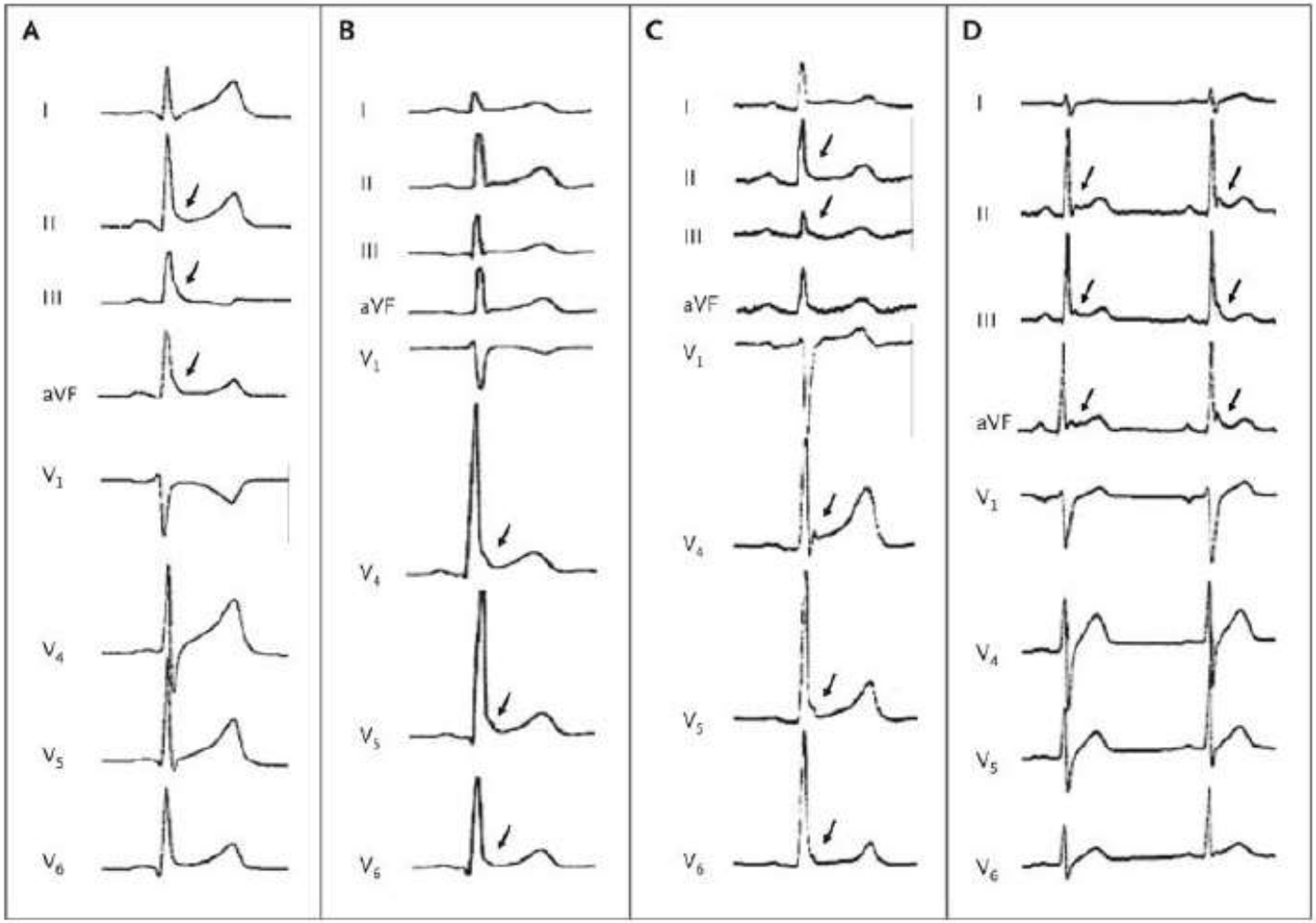
Population: 206 patients with sudden cardiac arrest due to idiopathic ventricular fibrillation, compared with 412 subjects free of cardiovascular disease.
Prevalence of early repolarization, defined as an elevation of the QRS–ST junction of ≥0.1 mV in the inferior or lateral lead, manifested as notching (J-wave) or QRS slurring.

31 % dei casi !

Haïssaguerre M et al. NEJM 2008; 358: 2016-23

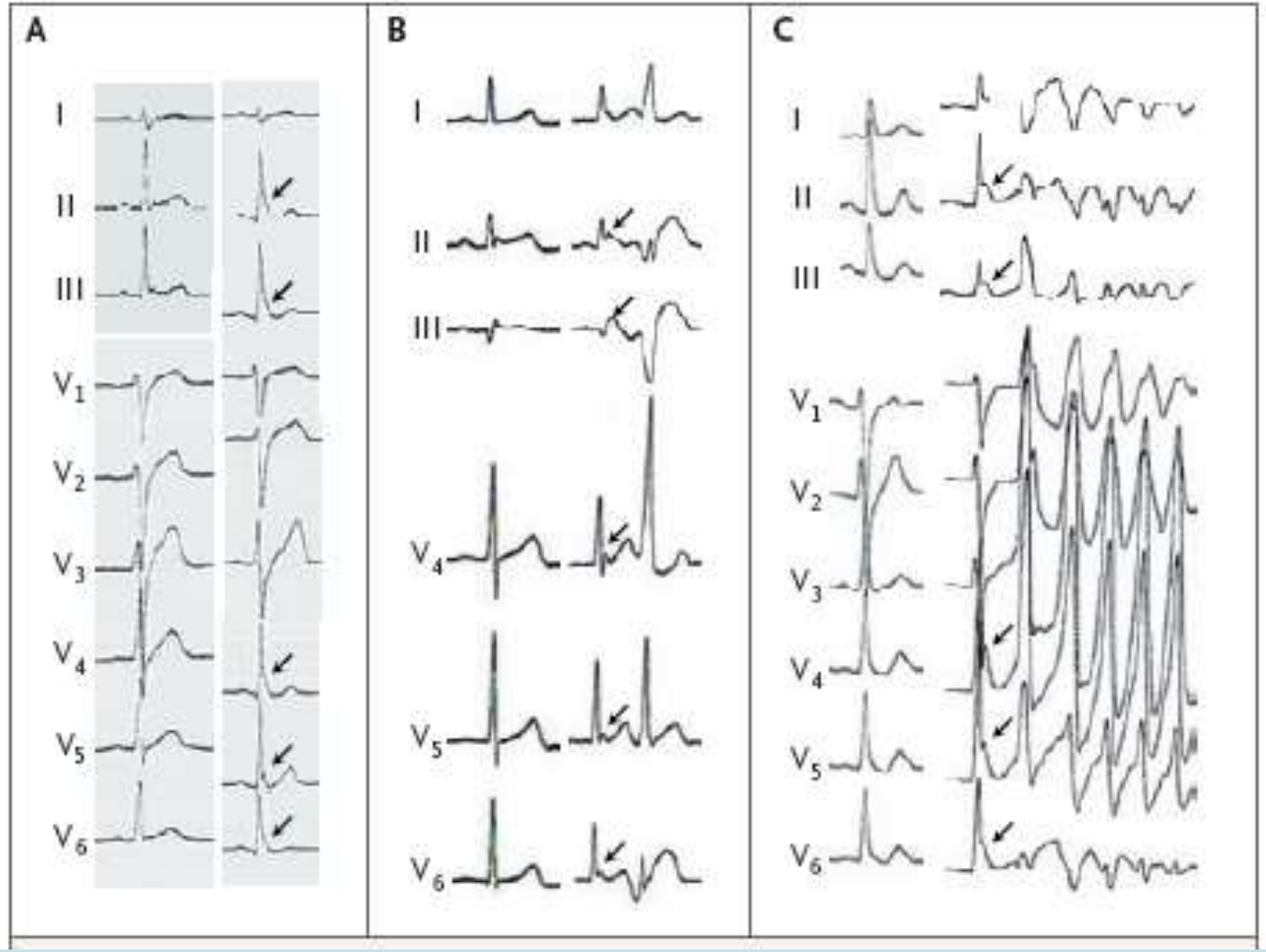
Sudden Cardiac Arrest Associated with Early Repolarization

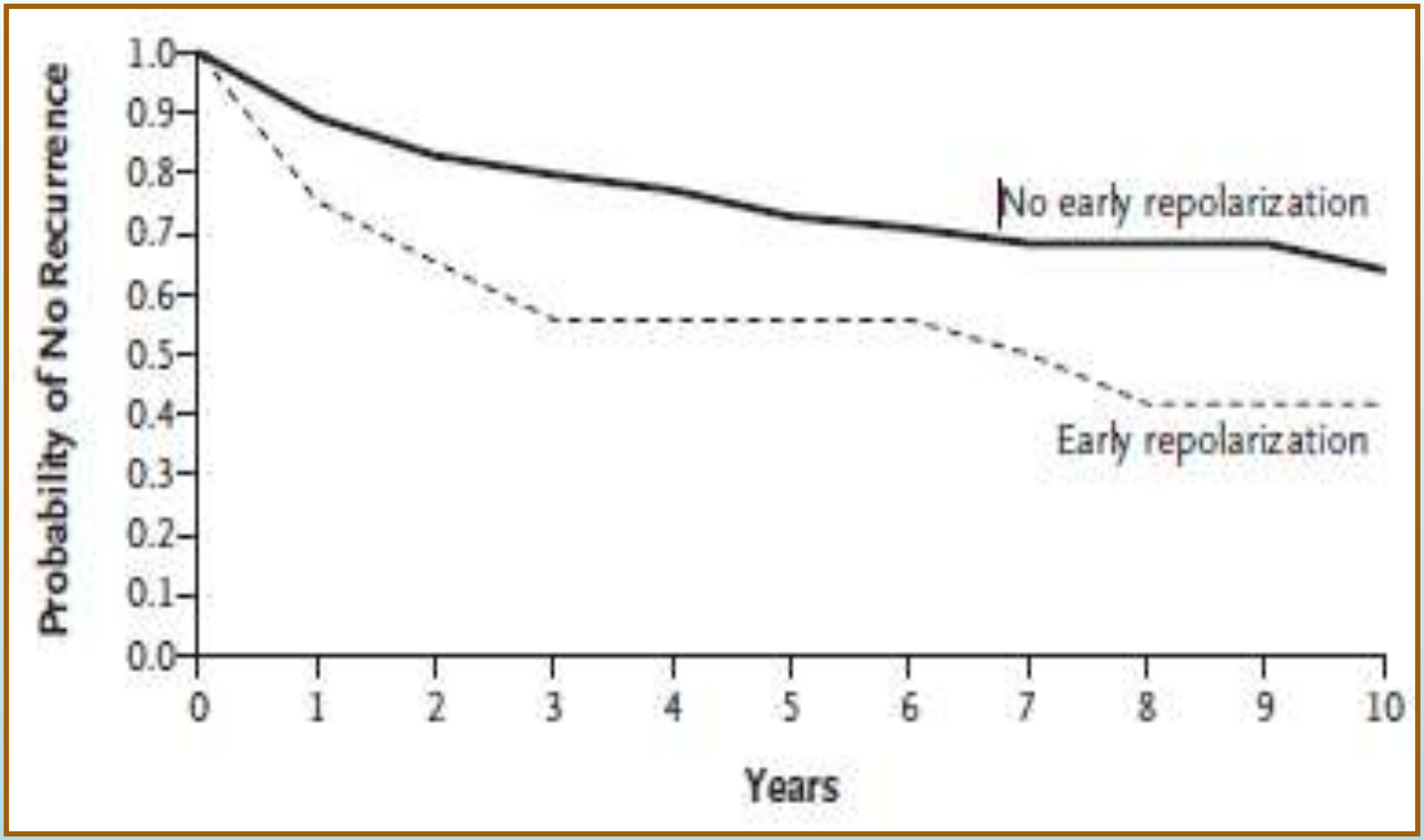
Michel Haïssaguerre, M.D., Nicolas Derval, M.D., Frederic Sacher, M.D.,



NEJM
2008

Associazione tra Pattern Ecgrafico e Tachiaritmia





During a 5-year follow-up period, ICD monitoring showed higher incidence of recurrent ventricular fibrillation in subjects with J-wave/QRS slurring.

Haïssaguerre M et al. NEJM 2008; 358: 2016-23

Results

- The prevalence of ER was higher in group of subjects with idiopathic VF with respect to the control group (31% vs. 5%; $p<0.001$).
- Localization:
  - ✓ 47% inferior leads
  - ✓ 44% inferior and lateral leads
  - ✓ 9% lateral leads.

Haïssaguerre M et al. NEJM 2008; 358: 2016-23

LA SOMIGLIANZA DELLE ALTERAZIONI DELLA RVP DEI SOGGETTI CON FIBRILLAZIONE V.IDIOPATICA CON LA RVP DEGLI SPORTIVI HA SOLLEVATO IL PROBLEMA DI COME COMPORTARSI NELLA PRATICA CLINICA

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Long-Term Outcome Associated with Early Repolarization on Electrocardiography

Jani T. Tikkanen, B.S., Olli Anttonen, M.D., M. Juhani Junttila, M.D., Aapo L. Aro, M.D., Tuomas Kerola, M.D., Harri A. Rissanen, M.Sc., Antti Reunanen, M.D., and Heikki V. Huikuri, M.D.

European Heart Journal Advance Access published May 29, 2012

European Heart Journal doi:10.1093/eurheartj/ehs110

REVIEW

Clinical update

Clinical significance of variants of J-points and J-waves: early repolarization patterns and risk

M. Juhani Junttila[1,2]*, Solomon J. Sager[1], Jani T. Tikkanen[2], Olli Anttonen[1], Heikki V. Huikuri[2], and Robert J. Myerburg[1]

[1]Division of Cardiology (D-39), Miller School of Medicine, University of Miami, PO Box 016960, Miami, FL 33101, USA; [2]Department of Internal Medicine, Institute of Clinical Medicine, University of Oulu, Oulu, Finland; and [3]Division of Cardiology, Pajat-Hame Central Hospital, Lahti, Finland

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doi:10.1016/j.jacc.2008.07.033

J-Point Elevation in Survivors of Primary Ventricular Fibrillation and Matched Control Subjects

Incidence and Clinical Significance

Raphael Rosso, MD,* Evgeni Kogan, MD,* Bernard Belhassen, MD,* Uri Rozovski, MD,* Melvin M. Scheinman, MD,§ David Zeltser, MD,* Amir Halkin, MD,* Arie Steinvil, MD,* Karin Heller, MD,* Michael Glikson, MD,† Amos Katz, MD,‡ Sami Viskin, MD*

Tel Aviv and Beer-Sheva, Israel; and San Francisco, California

Original Articles

J Wave, QRS Slurring, and ST Elevation in Athletes With Cardiac Arrest in the Absence of Heart Disease

Marker of Risk or Innocent Bystander?

Riccardo Cappato, MD; Francesco Furlanello, MD; Valerio Giovinazzo, MD; Tommaso Infusino, MD; Pierpaolo Lupo, MD; Mario Pittalis, MD; Sara Foresti, MD; Guido De Ambroggi, MD; Hussam Ali, MD; Elisabetta Bianco, MD; Roberto Riccamboni, MD; Gianfranco Butera, MD; Cristian Ricci, PhD; Marco Ranucci, MD; Antonio Pelliccia, MD; Luigi De Ambroggi, MD

Arrhythmia/Electrophysiology

Early Repolarization

Electrocardiographic Phenotypes Associated With Favorable Long-Term Outcome

Jani T. Tikkanen, BM; M. Juhani Junttila, MD; Olli Anttonen, MD; Aapo L. Aro, MD; Samuli Luttinen, BM; Tuomas Kerola, MD; Solomon J. Sager, MD; Harri A. Rissanen, MSc; Robert J. Myerburg, MD; Antti Reunanen, MD; Heikki V. Huikuri, MD

Circulation Journal
Official Journal of the Japanese Circulation Society
http://www.j-circ.or.jp

REVIEW

Early Repolarization Syndrome

– A New Electrical Disorder Associated With Sudden Cardiac Death –

Shinsuke Miyazaki, MD; Ashok J Shah, MD; Michel Haïssaguerre, MD

Distinguishing "benign" from "malignant early repolarizati

The value of the ST-segment morphology

Raphael Rosso, MD,*† Eran Glikson,*† Bernard Belhassen, MD,* Amos Katz, MD,† Amir Halkin, Arie Steinvil, MD,* Sami Viskin, MD*

*From the *Department of Cardiology, Tel Aviv Sourasky Medical Center and, Sackler School of Medicine, Tel A University, Tel Aviv, †Department of Cardiology, Barzilai Hospital, Ashkelon, and Ben Gurion University of the Beer-Sheva, Israel.*

Ability of Terminal QRS Notching to Distinguish Benign from Malignant Electrocardiographic Forms of Early Repolarization

Faisal M. Merchant, MD[a], Peter A. Noseworthy, MD[a], Rory B. Weiner, MD[a], Sheldon M. Singh, MD[b], Jeremy N. Ruskin, MD[b], and Vivek Y. Reddy, MD[c,*]

J-Point Elevation in Survivors of Primary Ventricular Fibrillation and Matched Control Subjects

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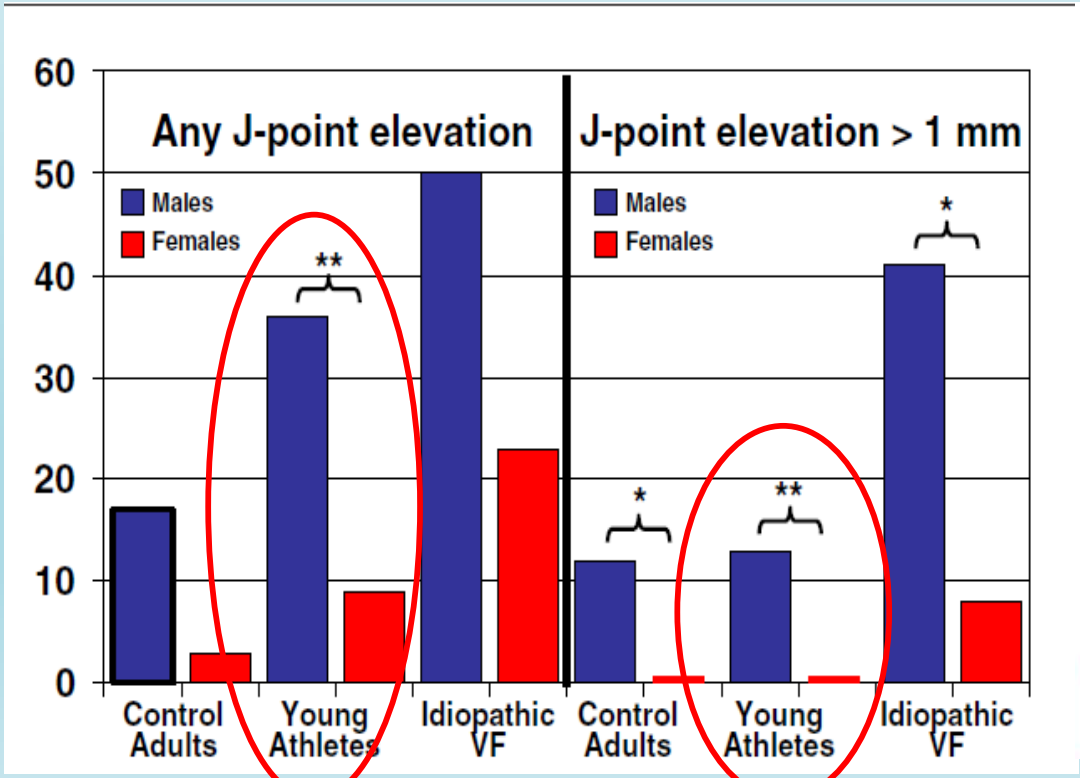

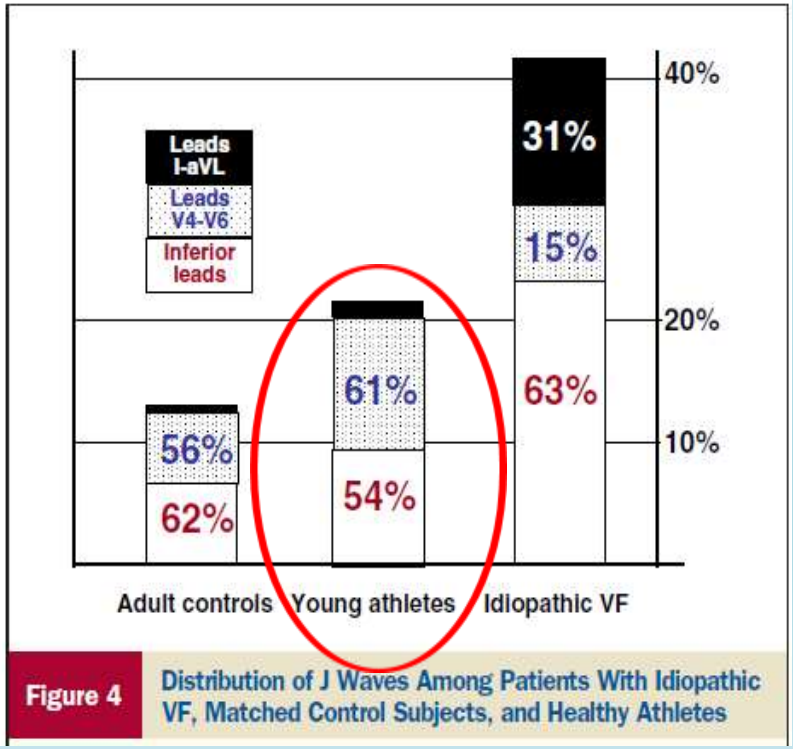

Figure 4 Distribution of J Waves Among Patients With Idiopathic VF, Matched Control Subjects, and Healthy Athletes

Original Articles

J Wave, QRS Slurring, and ST Elevation in Athletes With Cardiac Arrest in the Absence of Heart Disease

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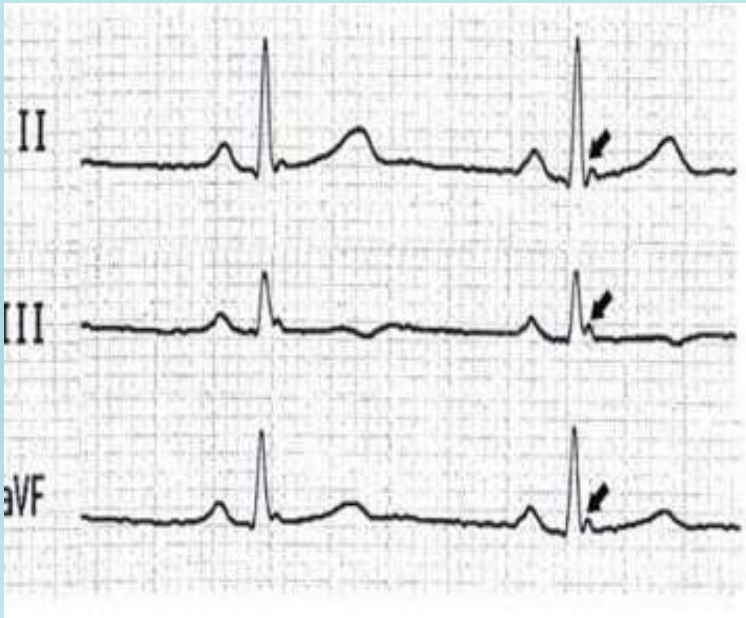
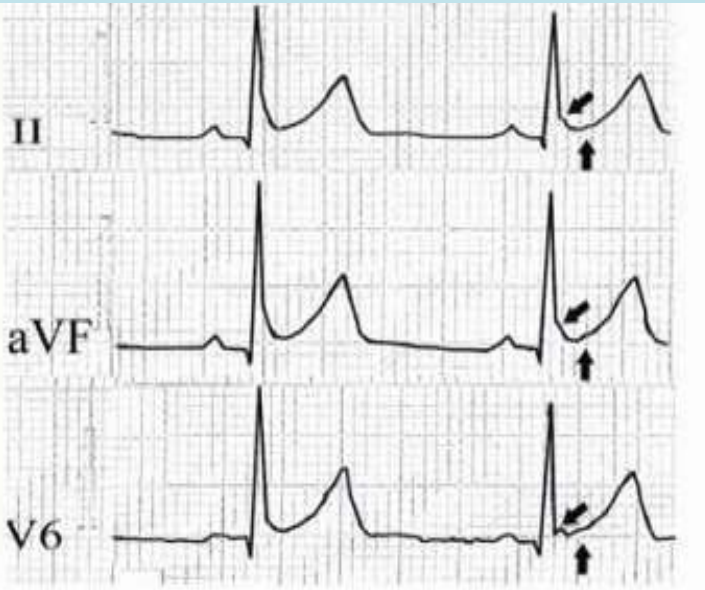
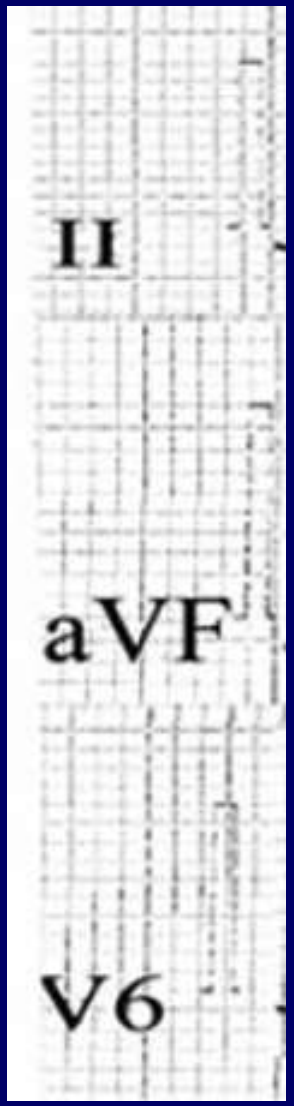
J-wave/QRS slurring is more frequent in athletes with cardiac arrest/sudden death than in control athletes





21 aa, calcio
Arresto cardiaco



29 aa, ciclismo
asintomatico

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Long-Term Outcome Associated with Early Repolarization on Electrocardiography

Jani T. Tikkanen, B.S., Olli Anttonen, M.D., M. Juhani Junttila, M.D., Aapo L. Aro, M.D., Tuomas Kerola, M.D., Harri A. Rissanen, M.Sc., Antti Reunanen, M.D., and Heikki V. Huikuri, M.D.

Table 3. Adjusted Relative Risk of Death from Cardiac Causes in the Secondary Analysis.*

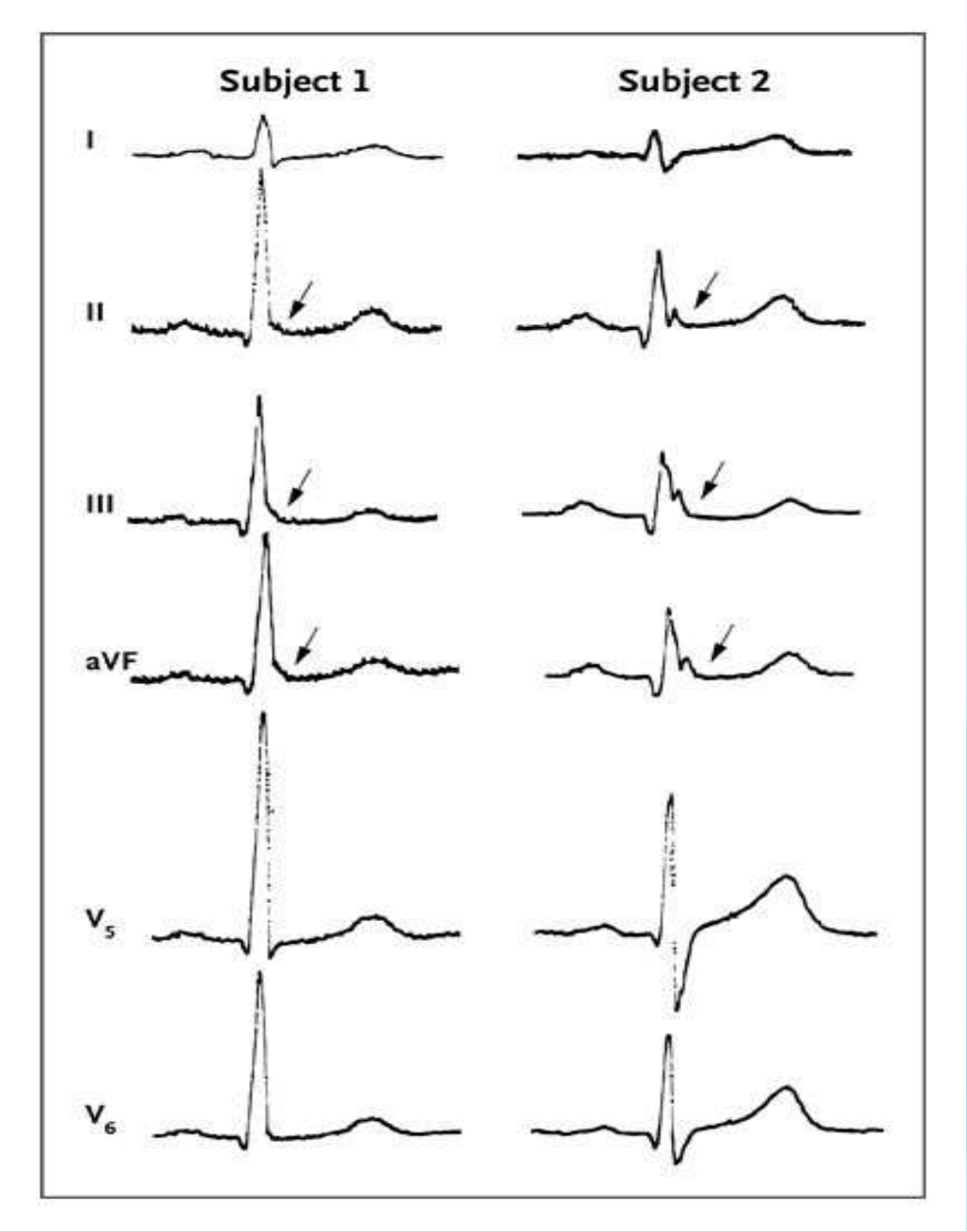
Variable	No. of Subjects	Relative Risk (95% CI)	P Value
Prolonged QTc interval	668	1.20 (1.02–1.42)	0.03
Left ventricular hypertrophy according to Sokolow–Lyon criteria	3410	1.16 (1.05–1.27)	0.004
J-point elevation in inferior leads			
≥0.1 mV	384	1.28 (1.04–1.59)	0.03
>0.2 mV	36	2.98 (1.85–4.92)	<0.001

* Relative risks were adjusted for age, sex, body-mass index, heart rate, smoking status, systolic blood pressure, and the presence of left ventricular hypertrophy or coronary artery disease on electrocardiography. QTc denotes QT interval corrected for heart rate.

TIKKANEN J.T. et aL NEW ENGL J MED 2009 361:2529-37

J-POINT ELEVATION OF MORE THAN 0.2 Mv IN THE INFERIOR LEADS

SLURRED ELEVATION



NOTCHED ELEVATION

TIKKANEN J.T.2009

Early Repolarization

Electrocardiographic Phenotypes Associated With Favorable Long-Term Outcome

Jani T. Tikkanen, BM; M. Juhani Junttila, MD; Olli Anttonen, MD; Aapo L. Aro, MD; Samuli Luttinen, BM; Tuomas Kerola, MD; Solomon J. Sager, MD; Harri A. Rissanen, MSc; Robert J. Myerburg, MD; Antti Reunanen, MD; Heikki V. Huikuri, MD

Background—Early repolarization (ER) in inferior/lateral leads of standard ECGs increases the risk of arrhythmic death. We tested the hypothesis that variations in the ST-segment characteristics after the ER waveforms may have prognostic importance.

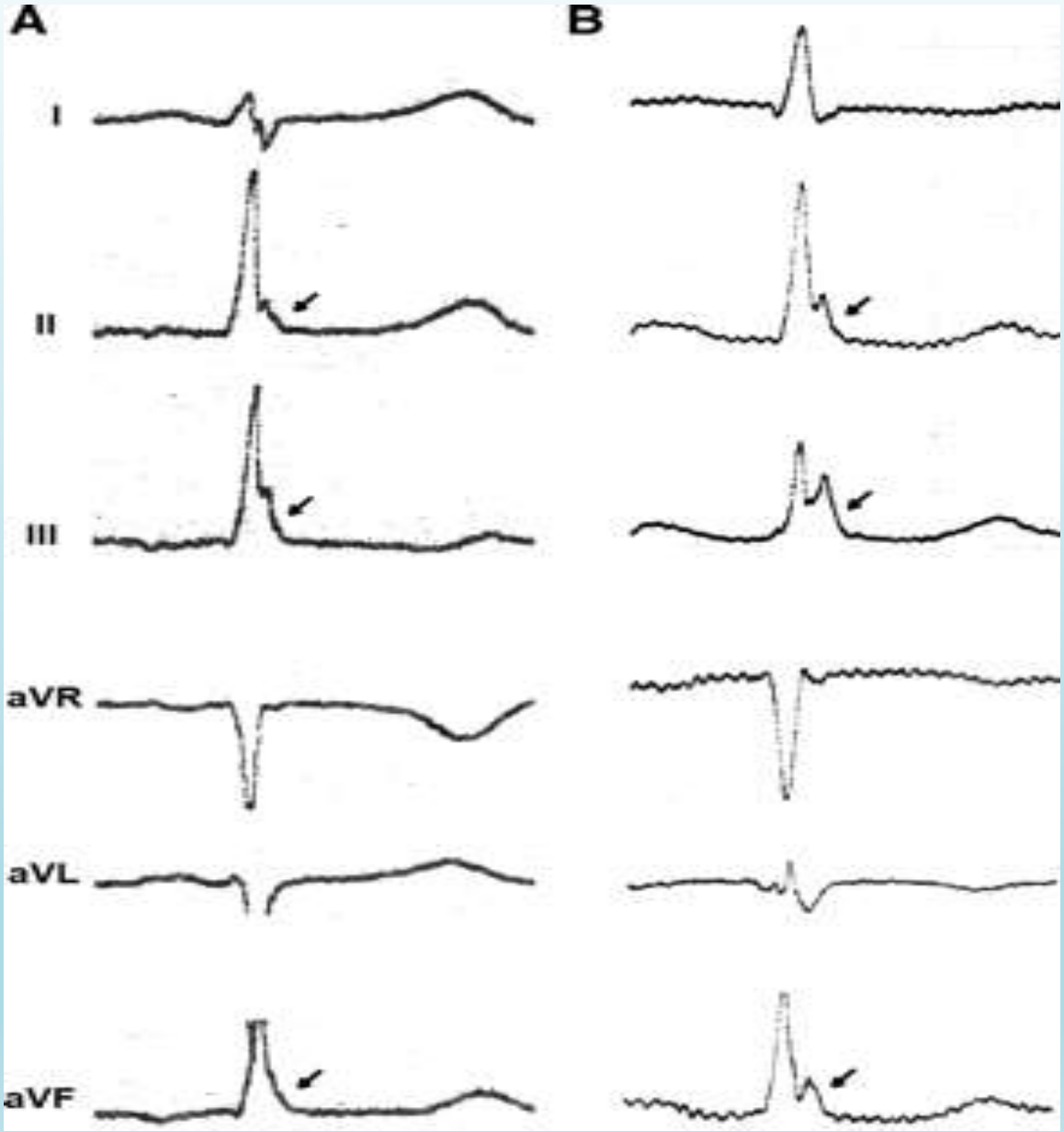
Methods and Results—ST segments after ER were classified as horizontal/descending or rapidly ascending/upsloping on the basis of observations from 2 independent samples of young healthy athletes from Finland (n=62) and the United States (n=503), where ascending type was the dominant and common form of ER. Early repolarization was present in 27/62 (44%) of the Finnish athletes and 151/503 (30%) of the US athletes, and all but 1 of the Finnish (96%) and 91/107 (85%) of US athletes had an ascending/upsloping ST variant after ER. Subsequently, ECGs from a general population of 10 864 middle-aged subjects were analyzed to assess the prognostic modulation of ER-associated risk by ST-segment variations. Subjects with ER ≥0.1 mV and horizontal/descending ST variant (n=412) had an increased hazard ratio of arrhythmic death (relative risk 1.43; 95% confidence interval 1.05 to 1.94). When modeled for higher amplitude ER (>0.2 mV) in inferior leads and horizontal/descending ST-segment variant, the hazard ratio of arrhythmic death increased to 3.14 (95% confidence interval 1.56 to 6.30). However, in subjects with ascending ST variant, the relative risk for arrhythmic death was not increased (0.89; 95% confidence interval 0.52 to 1.55).

Conclusions—ST-segment morphology variants associated with ER separates subjects with and without an increased risk of arrhythmic death in middle-aged subjects. Rapidly ascending ST segments after the J-point, the dominant ST pattern in healthy athletes, seems to be a benign variant of ER. (***Circulation***. **2011;123:2666-2673.**)

Key Words: arrhythmia ■ electrocardiography ■ epidemiology ■ follow-up studies ■ risk factors

VARIANTI MORFOLOGICHE ST

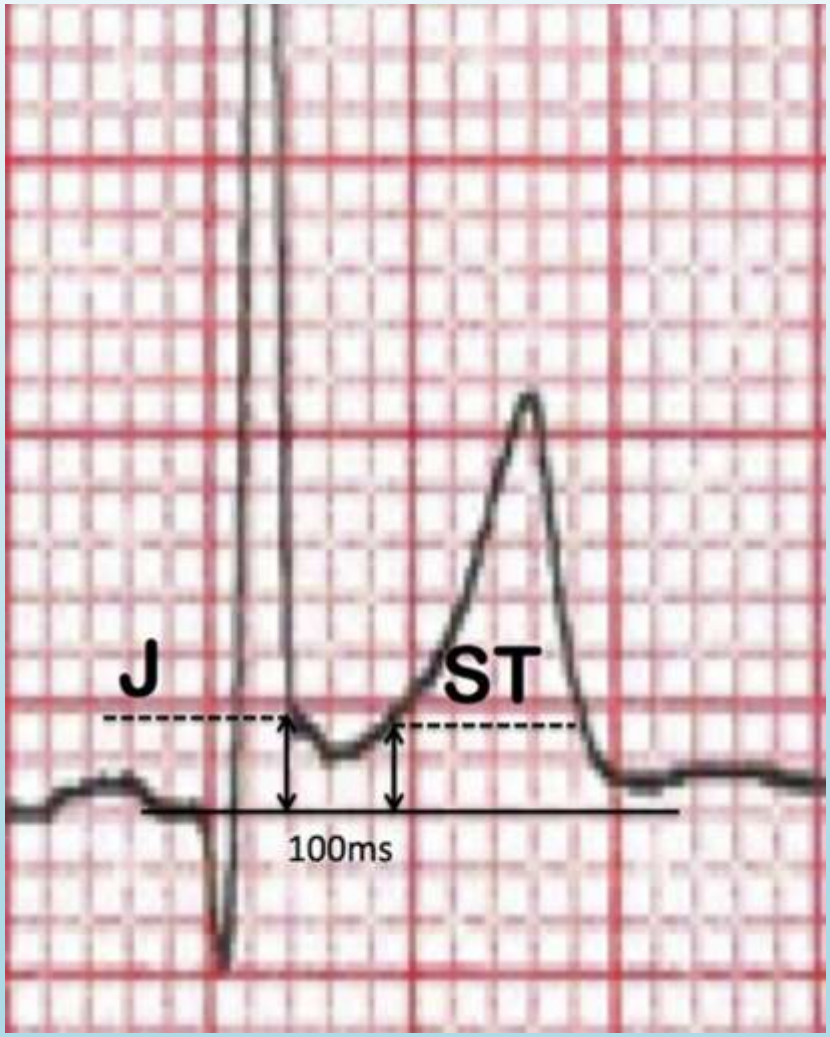
ST ORIZZONTALE/ DISCENDENTE



ST ORIZZONTALE/ DISCENDENTE

TIKKANEN J.T.2011

ECG example of rapidly ascending early repolarization (ER).



Greg Mellor et al. Circ Arrhythm Electrophysiol. 2016;9:e003960

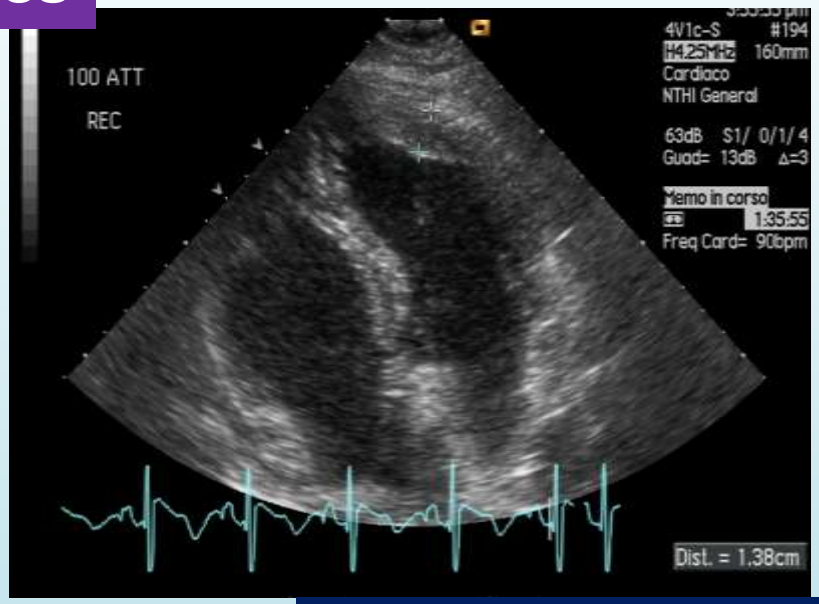
American Heart Association

J Cardiovasc Electrophysiol. 2012 Sep;23(9):938-44. doi: 10.1111/j.1540-8167.2012.02325.x. Epub 2012 May 15.

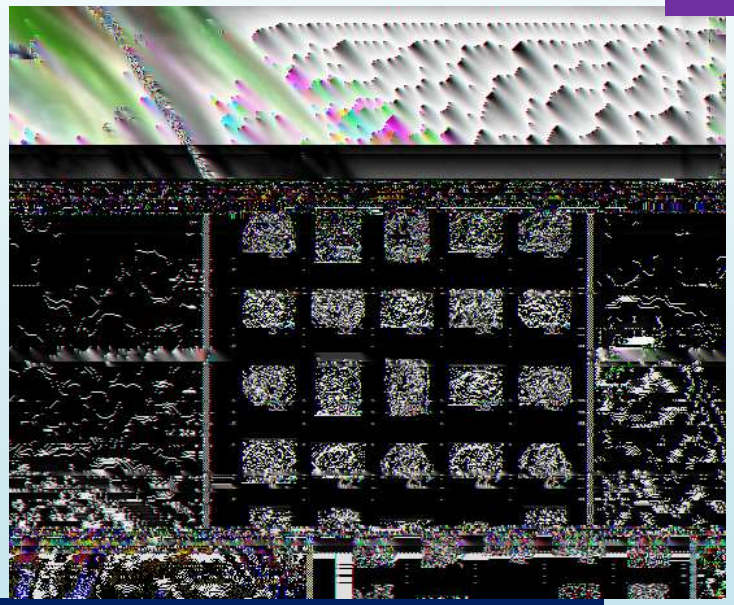
The prevalence of early repolarization in patients with noncompaction cardiomyopathy presenting with malignant ventricular arrhythmias.

Caliskan K1, Ujvari B, Bauernfeind T, Theuns DA, Van Domburg RT, Akca F, Jordaens L, Simoons ML, Szili-Torok T.

ECO

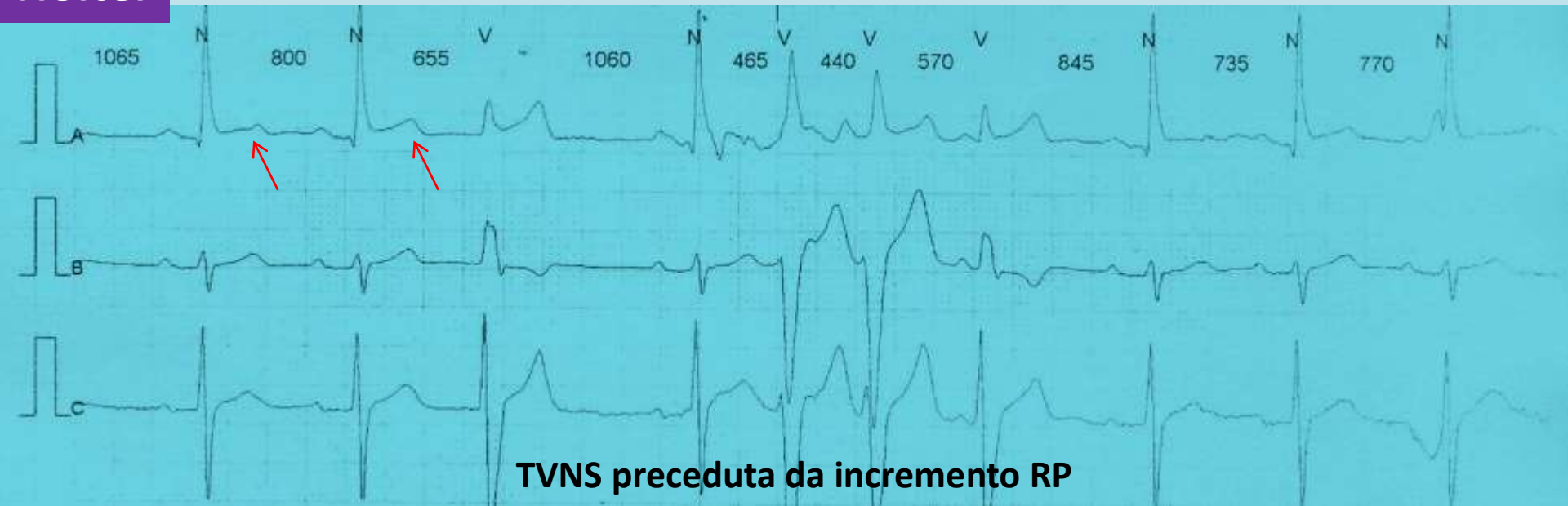


RM



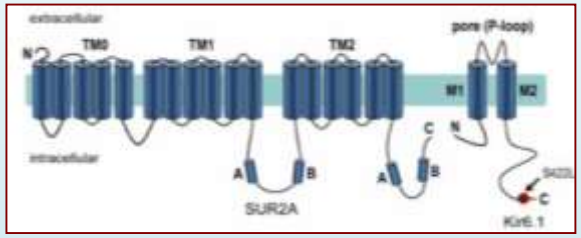
Cardiomiopatia da Miocardio Non Compatto

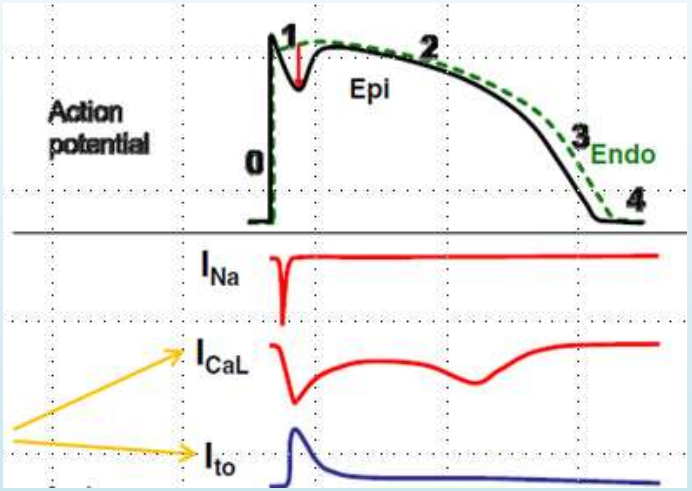
Holter

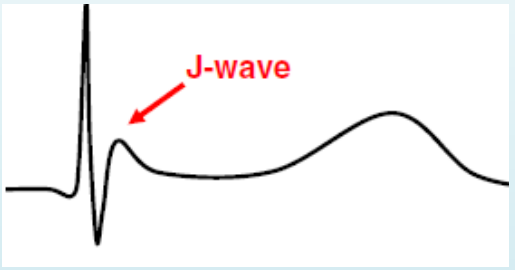


TVNS preceduta da incremento RP

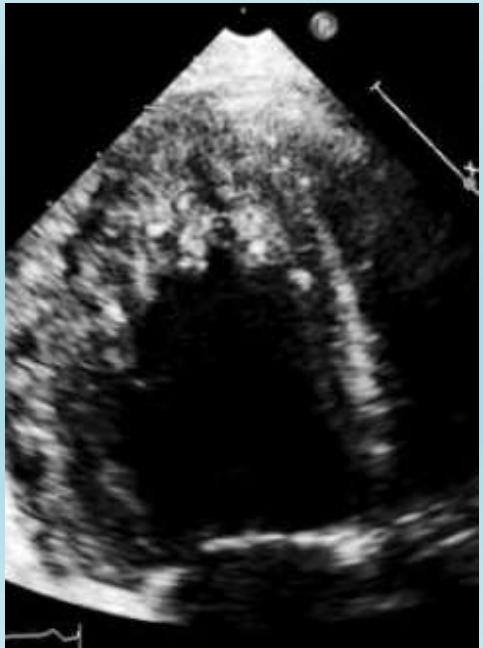
canalopatia → **ALTERATA RIPOLARIZZAZIONE** → RP

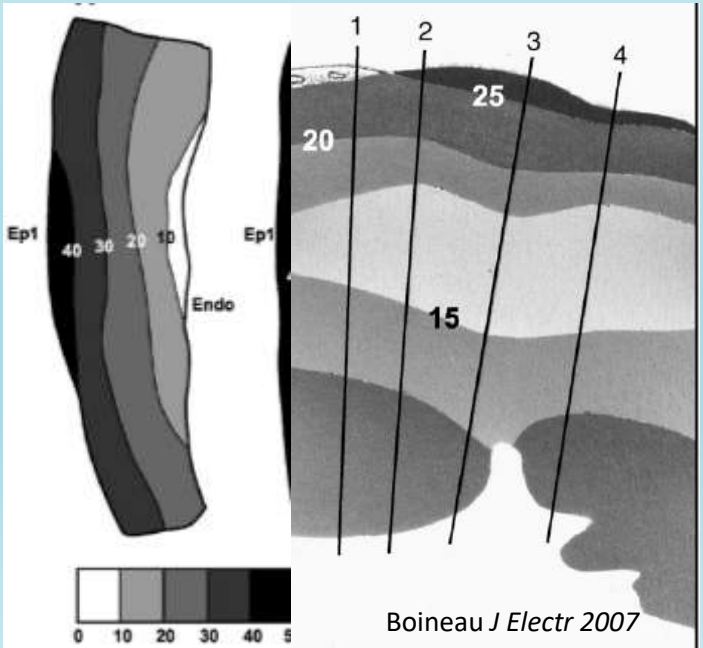




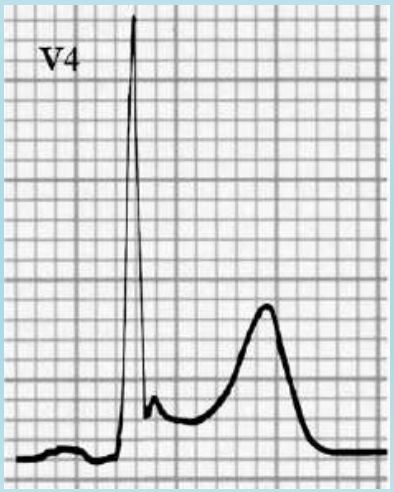


cardiomiopatia → **ALTERATA DEPOLARIZZAZIONE** → RP





Boineau *J Electr 2007*



Circulation
Arrhythmia and Electrophysiology

American Heart Association®

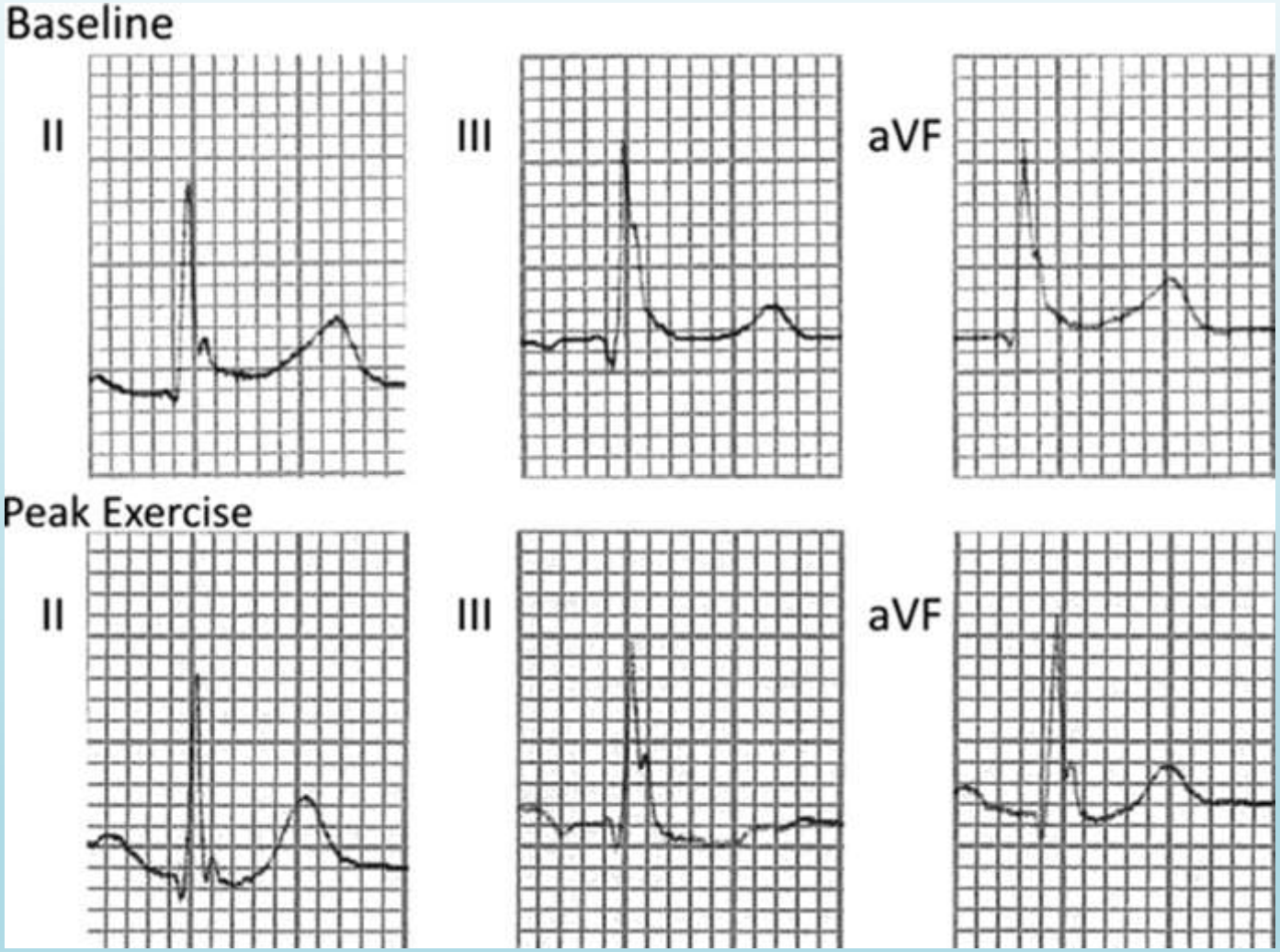
The Prevalence and Significance of the Early Repolarization Pattern in Sudden Arrhythmic Death Syndrome Families

Greg Mellor, Christopher P. Nelson, Claire Robb, Hariharan Raju, Yanushi Wijeyeratne, Christian Hengstenberg, Wibke Reinhard, Michael Papadakis, Sanjay Sharma, Nilesh J. Samani and Elijah R. Behr

Circ Arrhythm Electrophysiol. 2016;9:
doi: 10.1161/CIRCEP.116.003960

La presenza di un pattern ER è più comune nei familiari di I grado di pazienti deceduti per SADS. In tali pazienti esiste un'eterogeneità fenotipica del pattern ER, che implica un'eterogeneità dei meccanismi fisiopatologici responsabili dell'aumentato rischio familiare di morte cardiaca improvvisa.

Early repolarization (ER) persisting with exercise.



American Heart Association

Greg Mellor et al. Circ Arrhythm Electrophysiol. 2016;9:e003960

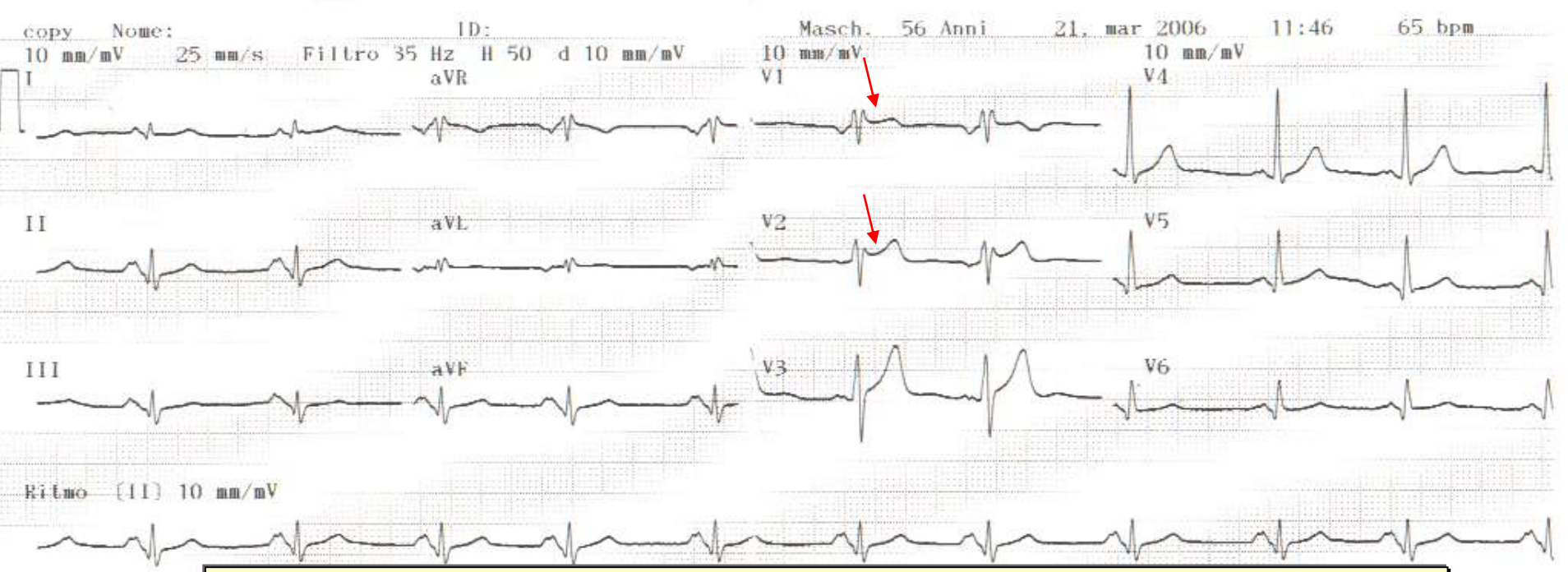
ECG Abnormalities in the Athlete

Common ECG patterns (up to 80%)*	**Uncommon ECG patterns (<5%)†**
•Sinus bradycardia; •First degree AV block; •Notched QRS in V1 or incomplete RBBB; •Early repolarization; •Isolated QRS voltage criteria for left ventricular **hypertrophy**	•T-wave inversion; •ST-segment depression; •Pathological Q waves; •Left atrial enlargement; •Left axis deviation/left anterior hemiblock; •Right axis deviation/left posterior hemiblock; •Right ventricular hypertrophy; •Complete LBBB or /RBBB; •Long or short QT interval;
DIAGNOSI DIFFERENZIALE →	•Brugada-like early repolarization; •Ventricular arrhythmias

Corrado D, McKenna WJ: Eur Heart J 2007 ;28:1920-2

Antzelevich et al, Heart Rhythm 2016

	BrS	ERS
Similarities between BrS and ERS		
Male predominance	Yes (>75%)	Yes (>80%)
Average age of first event	30-50	30-50
Associated with mutations or rare variants in *KCNJ8, CACNA1C, CACNB2, CACNA2D, SCN5A, ABCC9, SCN10A*	Yes	Yes
Relatively short QT intervals in subjects with Ca channel mutations	Yes	Yes
Dynamicity of ECG	High	High
VF often occurs during sleep or at a low level of physical activity	Yes	Yes
VT/VF trigger	Short-coupled PVC	Short-coupled PVC
Fever	Augmented J waves	Augmented J waves (rare)
Hypothermia	Augmented J waves mimicking BrS	Augmented J waves



DD con Pattern di Brugada- precordiali dx alte

Brugada Type 1

- RBB pattern
- Coved ST-segment
- ≥2 mm in V1–V3

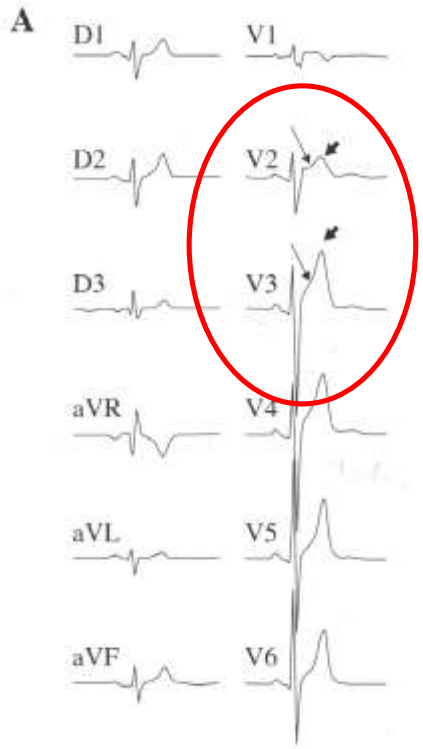
Brugada Type 2

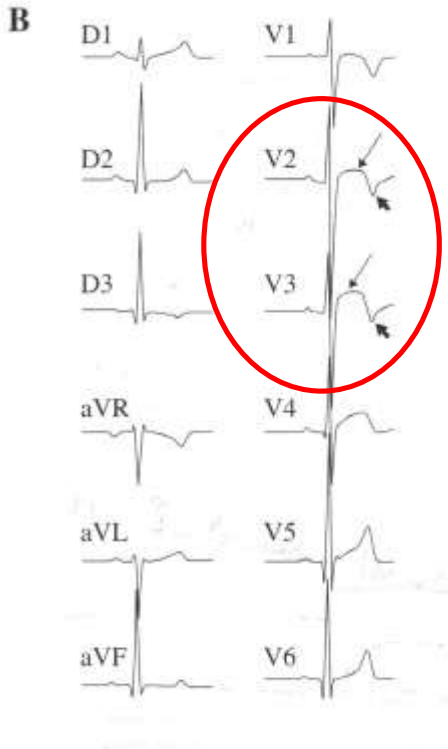
- Saddleback ST-segment
- ST-elevation >2 mm
- ST-trough >1-mm elevation followed by positive or biphasic T-wave

Brugada Type 3

- ST-segment saddle-back or coved
- ST-elevation <1 mm

Manoj N. Obeyesekere. Circulation. A Clinical Approach to Early Repolarization, Volume: 127, Issue: 15, Pages: 1620-1629, DOI: (10.1161/CIRCULATIONAHA.112.143149)

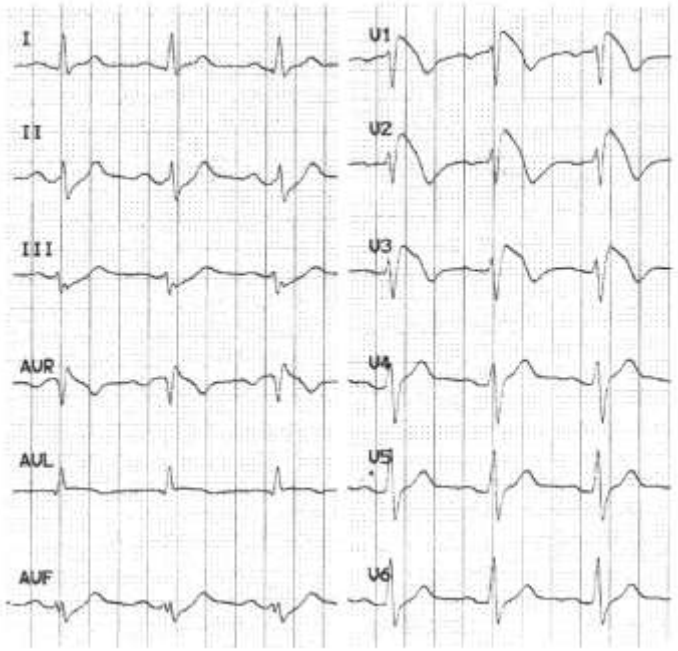


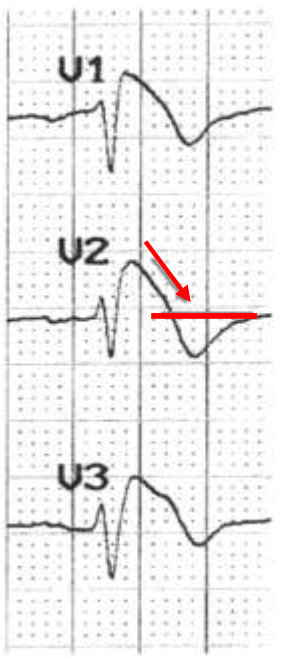


DD CON PATTERN BRUGADA TIPO1

PATTERN RVP TIPO 1

PATTERN RVP TIPO 2

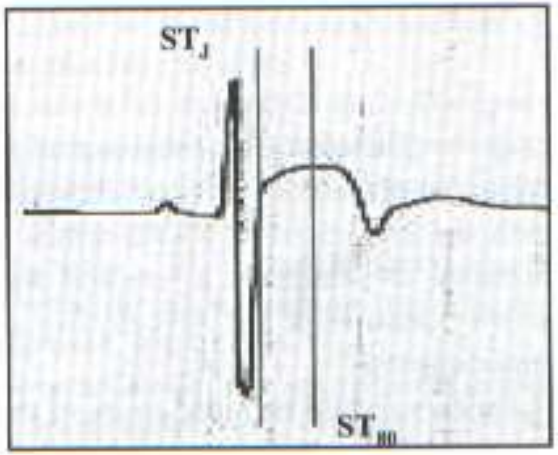




DD con Pattern di Brugada- il rapporto STJ/ST80

Pattern di Brugada

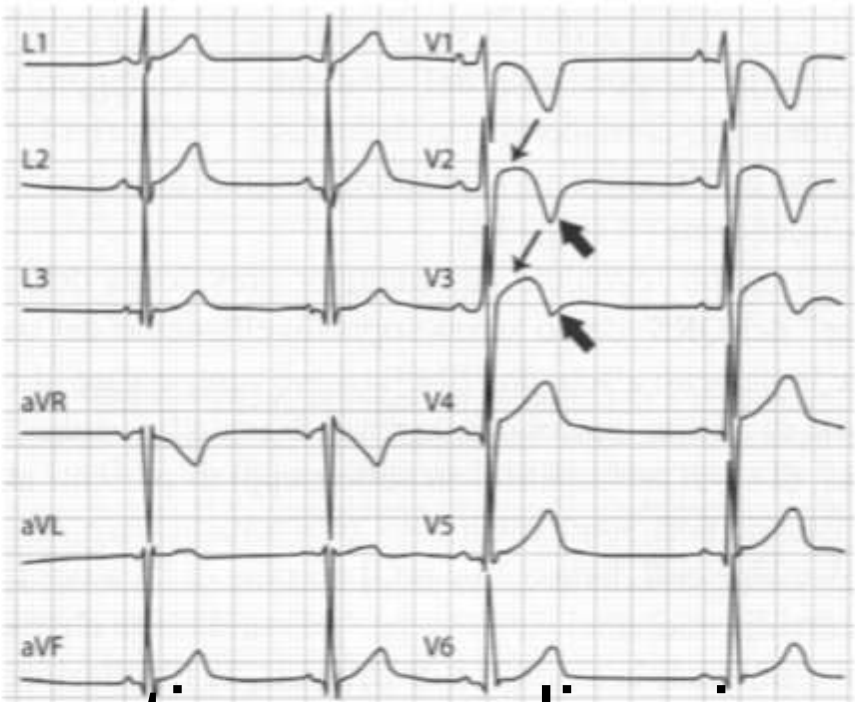
Ripolarizzazione Precoce



STJ / ST80 < 1 → **Ripolarizzazione precoce**

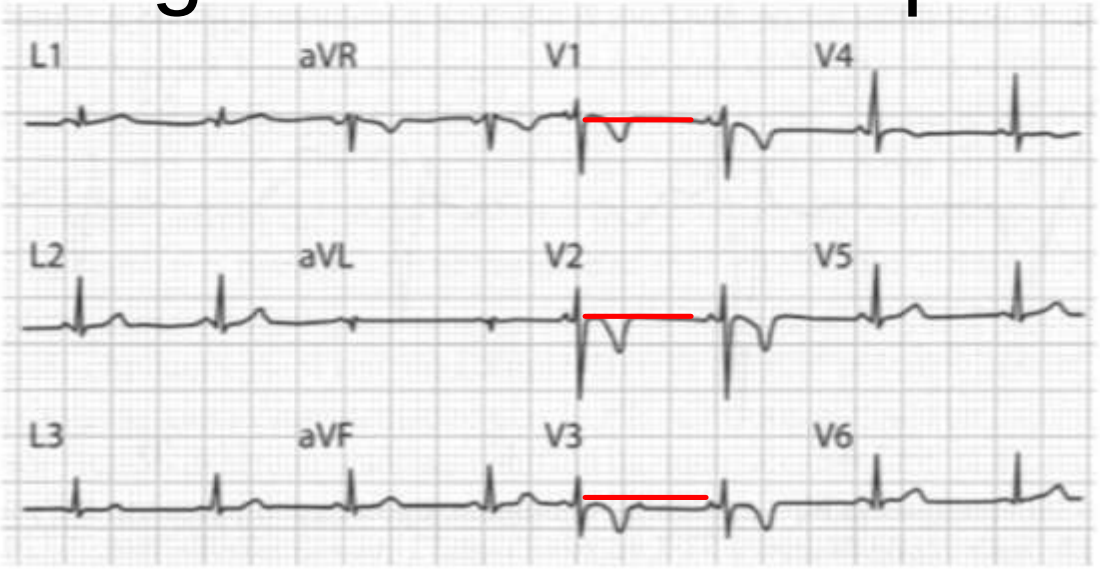
Corrado D,Leoni L,Pelliccia A et al. *Pac.Clin.Electrophisiol.*2003;26:449

DD



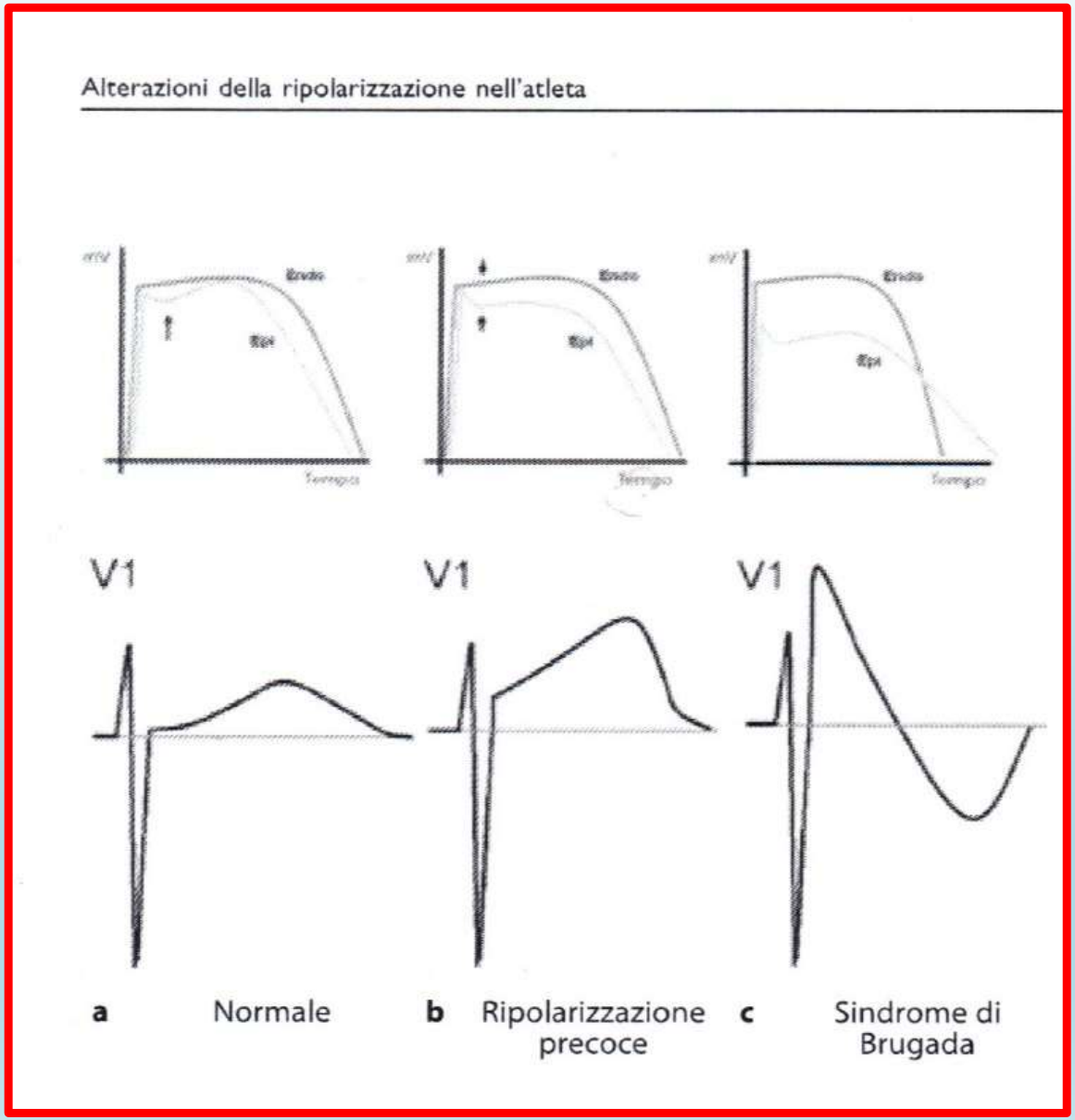
ERP

T negativa «cardiomiopatica»



ARVC

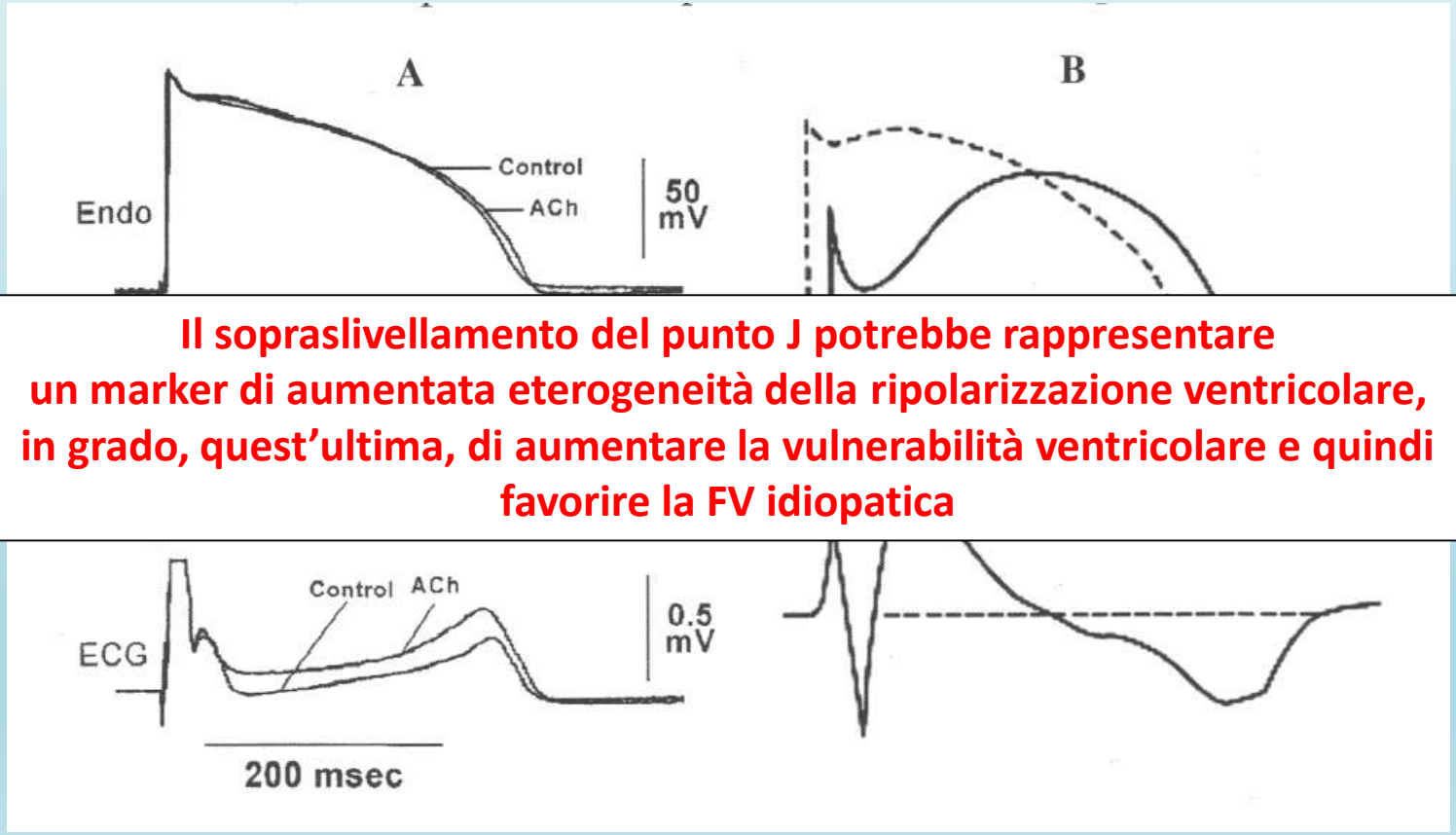
BASI ELETTROFISIOLOGICHE DELLA RP E DELLA S.DI BRUGADA



Journal of Electrocardiology 38 (2005) 26–32

ST-segment elevation in the early repolarization syndrome, idiopathic ventricular fibrillation, and the Brugada syndrome: cellular and clinical linkage☆

Juan Shu, MD[a], Tiangang Zhu, MD, PhD[b], Lin Yang, MD[a],

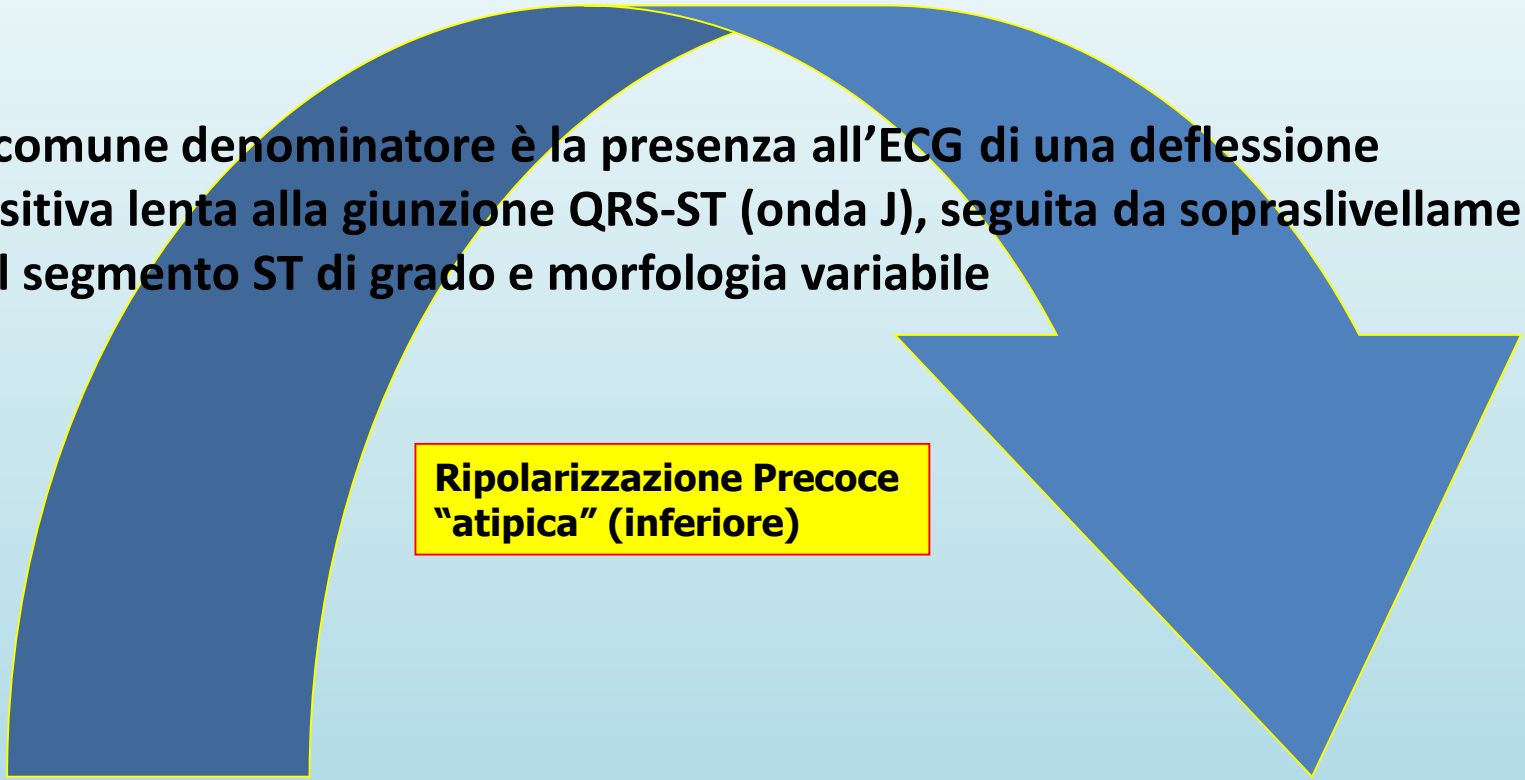


Il sopraslivellamento del punto J potrebbe rappresentare un marker di aumentata eterogeneità della ripolarizzazione ventricolare, in grado, quest'ultima, di aumentare la vulnerabilità ventricolare e quindi favorire la FV idiopatica

CANALI Ito DEL POTASSIO

Il "continuum" della Ripolarizzazione precoce:

IL comune denominatore è la presenza all'ECG di una deflessione positiva lenta alla giunzione QRS-ST (onda J), seguita da sopraslivellamento del segmento ST di grado e morfologia variabile



Sindrome dell'onda J

Clinical significance of J-wave/QRS slurring in athletes ?

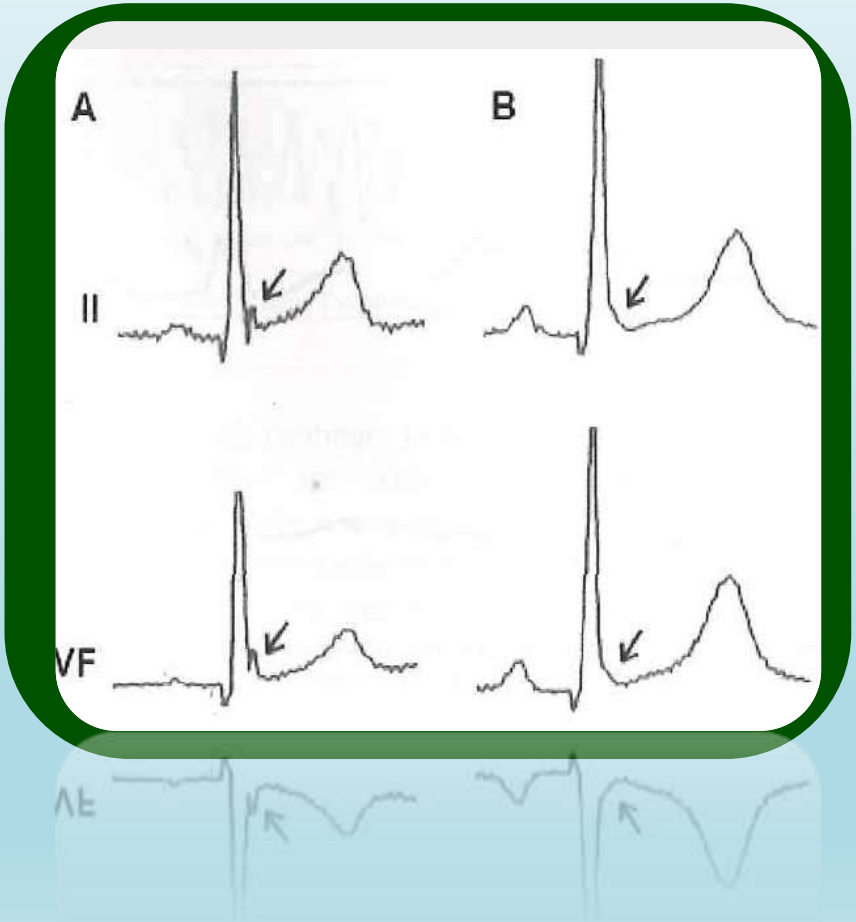
A silent marker of an electrical cardiac disease

A benign expression of autonomic imbalance

Characteristics of benign ER

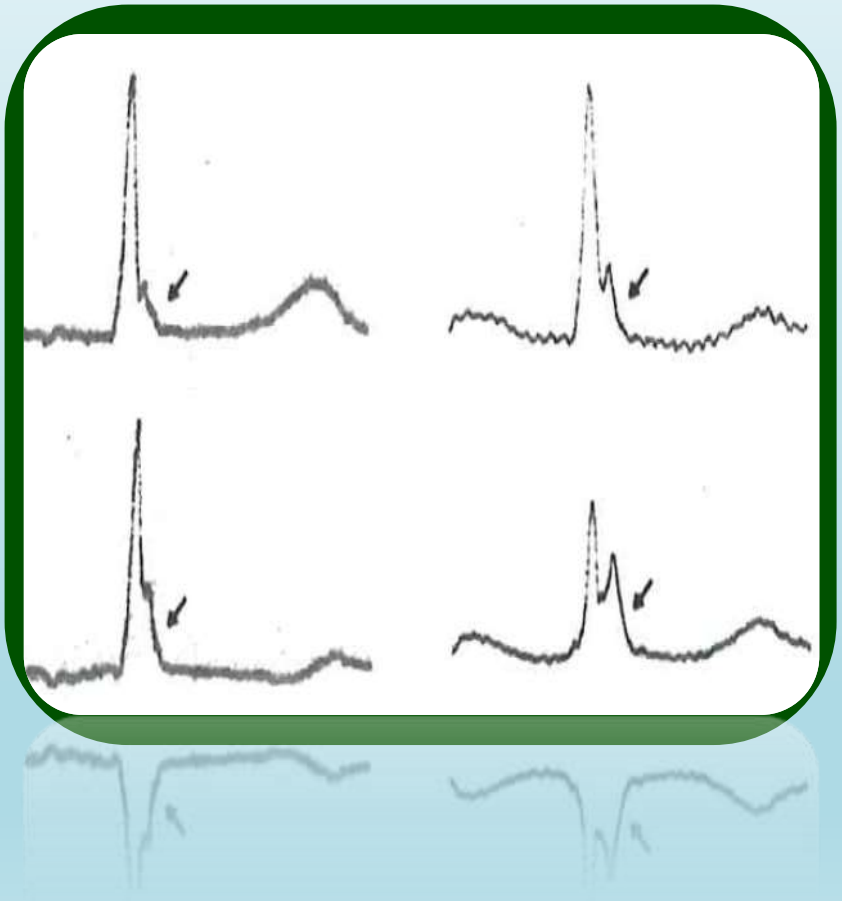
(*Pelliccia and Quattrini, Heart Rhythm 2015)*

- Distribution in anterior and lateral leads
- Low amplitude of J-wave (≤0.2 mV)
- ST-segment morphology (ascending with positive, peaked T-wave), increased R/S-wave voltages
- Modest dynamic changes over time
- No symptoms, no family Hx of SD



Characteristics of malignant ER *(Tikkanen JT and Huikuri VH J Electrocardiol 2015)*

- Distribution in inferior and lateral leads
- Amplitude of J-wave (>0.2 mV)
- Dynamic, marked changes (increased amplitude precedes VF)
- ST-segment morphology (horizontal or descending)
- Associated short-coupled PVBs
- Unexplained syncope
- Family Hx of sudden death



Contemporary definition of Early Repolarization

- Early Repolarization pattern, is the presence of J-point elevation of ≥0.1 mV, in ≥2 inferior and/or lateral leads on 12-lead ECG;
- Early Repolarization Syndrome is the presence of ER pattern in a patient resuscitated from VF, or in a SD victim with negative autopsy and previous evidence of ER pattern

COCIS ARITMIE 2017 vs 2009

- ***MALATTIE DEI CANALI IONICI***
  - -QT lungo
  - -QT corto
  - -Brugada
  - -Ripolarizzazione precoce (Early repolarization)
  - -Malattia di conduzione ereditaria (m. di Lenegre)
  - -TV catecolaminergica
- ***INDICAZIONI ALL' ABLAZIONE***
- ***RIPRESA DELL' ATTIVITA' DOPO ABLAZIONE***
- ***ATTIVITA' SPORTIVA NEI PORTATORI DI PM***
- ***ATTIVITA' SPORTIVA NEI PORTATORI DI ICD***

Ripolarizzazione Precoce

La ripolarizzazione precoce (RP) è un rilievo comune nell'atleta e ha un significato benigno. Di regola la RP dell'atleta è caratterizzata da sopraslivellamento di ST nelle derivazioni precordiali (destre o sinistre)…

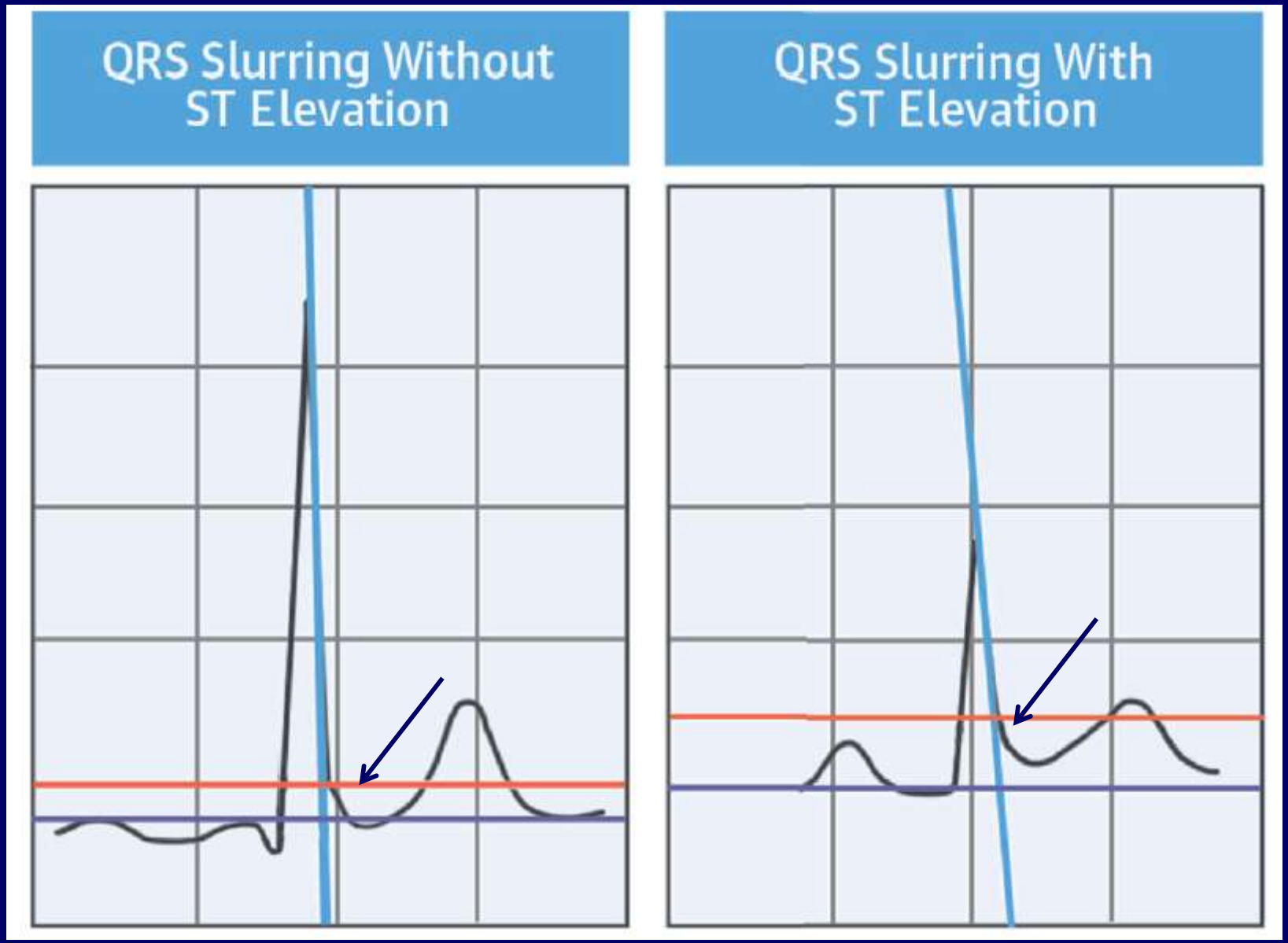
COCIS 2017
Ripolarizzazione precoce

La RP maligna si caratterizza all'ECG per la presenza all'ECG in in almeno 2 derivazioni inferiori e/o precordiali sinistre di impastamenti terminali del QRS (slurring o notching) >/= 2mm con ST rettilineo o discendente. L'assenza di sopraslivellamento di ST la differenzia da quella benigna.

La sola presenza di RP (slurring o notching) >/= 2mm in almeno 2 derivazioni infero-laterali ed ST rettilineo o discendente in soggetti asintomatici e in assenza di altri fattori di rischio non consente la diagnosi.

La sola RP all'ecg (in assenza di manifestazioni cliniche) non condiziona l'idoneita' allo sport

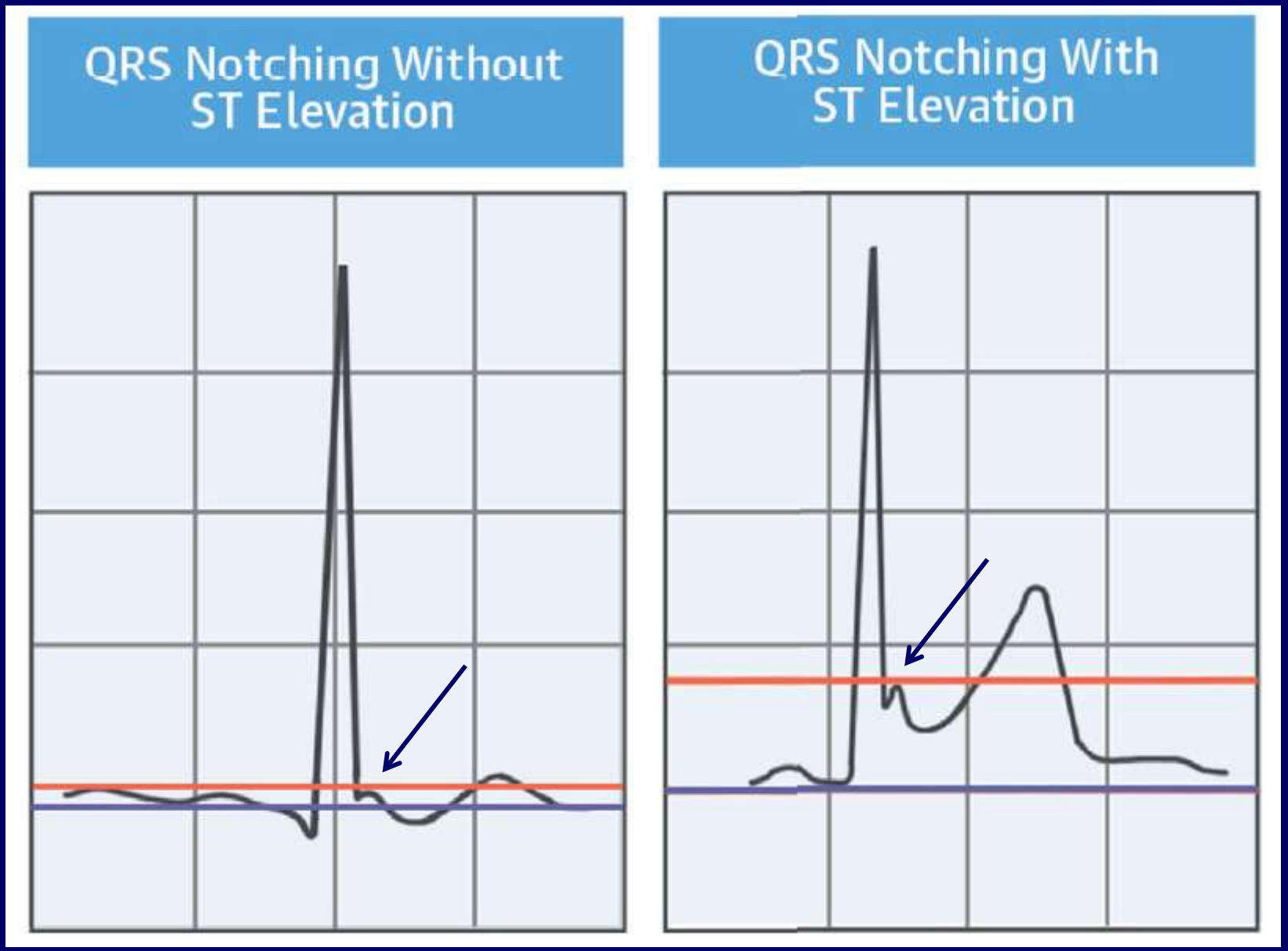
(J Am Coll Cardiol 2015;66:470-7)



Sospetta

Benigna

(J Am Coll Cardiol 2015;66:470–7)



Sospetta

Benigna

L'idoneità può essere concessa

- *nella RP benigna ST sopraslivellato*
- *nella RP (slurring e notching) senza ST sopraslivellato, in assenza di elementi che possano far sospettare una RP maligna*

L'idoneità dovrebbe essere negata

- *Nei soggetti sintomatici per arresto cardiaco o sincope di natura cardiaca*
- *Nei soggetti asintomatici con RP potenzialmente maligna e fattori di rischio*
- *Nei soggetti asintomatici che presentano sia pattern ECG di Brugada che RP potenzialmente maligna*

RP maligna e fattori di rischio

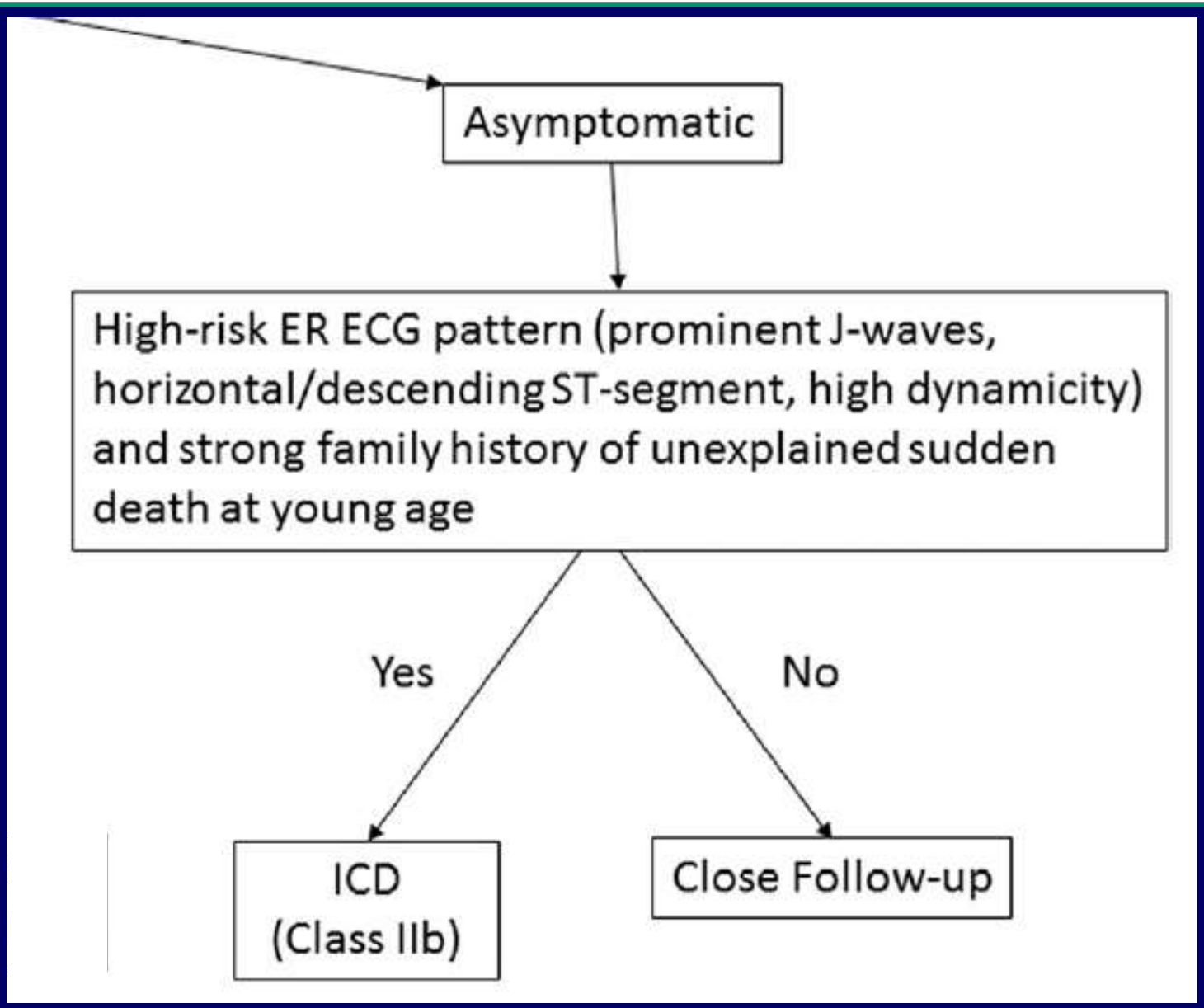
- *Nei soggetti asintomatici con RP potenzialmente maligna e fattori di rischio (BPV molto precoci, sincope, familiarità per morte improvvisa giovanile)*

RP maligna associata alla sindrome di Brugada nello stesso soggetto

- *Nei soggetti asintomatici che presentano sia pattern ECG di Brugada che RP potenzialmente maligna (slurring o notching > /=2mm in almeno 2 derivazioni info-laterali ed ST rettilineo o discendente)*

COSA FARE NELLA ER POTENZIALMENTE MALIGNA

Antzelevich eta l, Heart Rhythm 2016



CENTRO DI MEDICINA DELLO SPORT

AMBULATORIO CARDIOLOGICO

grazie

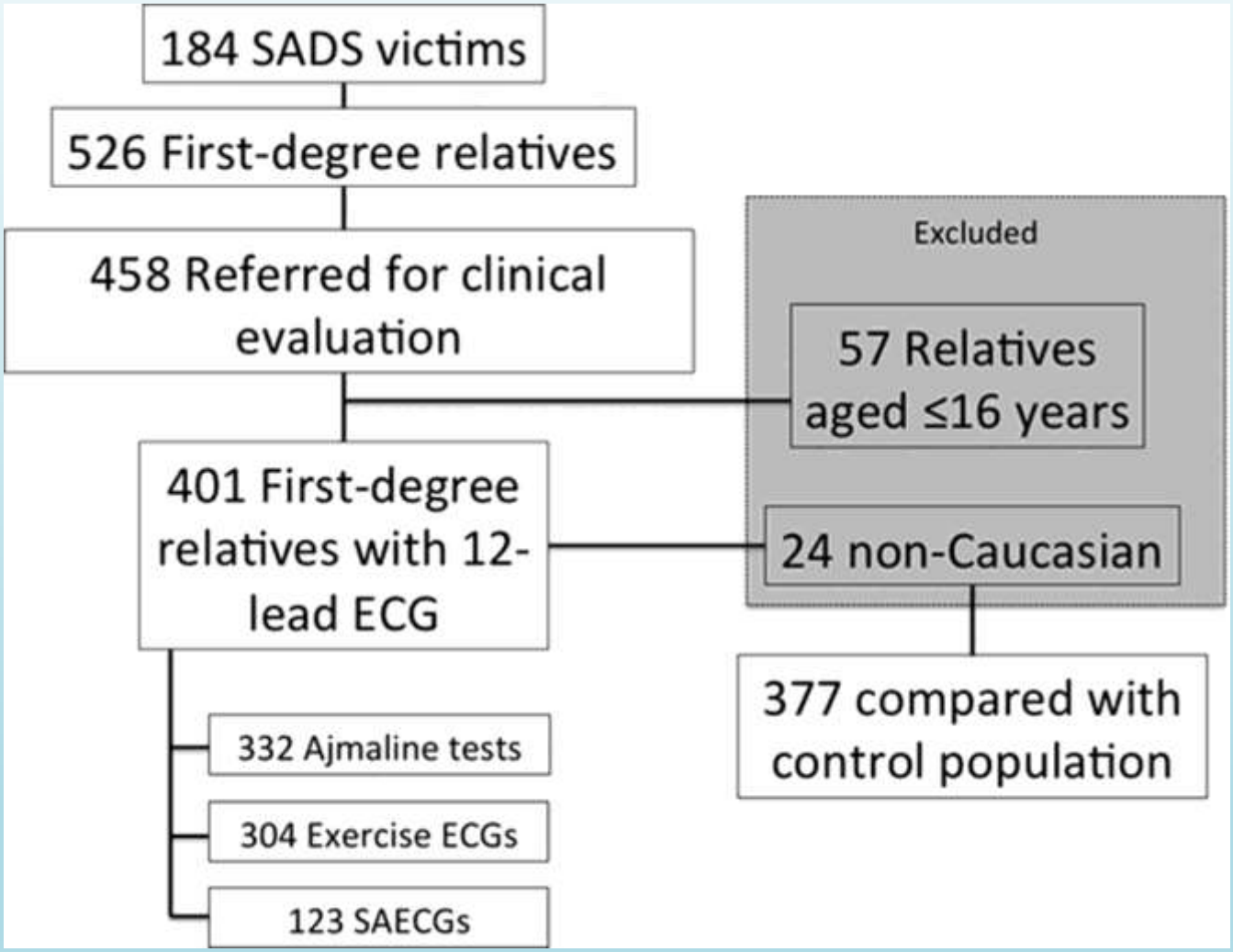
J-Wave syndromes expert consensus conference report: Emerging concepts and gaps in knowledge

Antzelevich et al, Heart Rhythm 2016

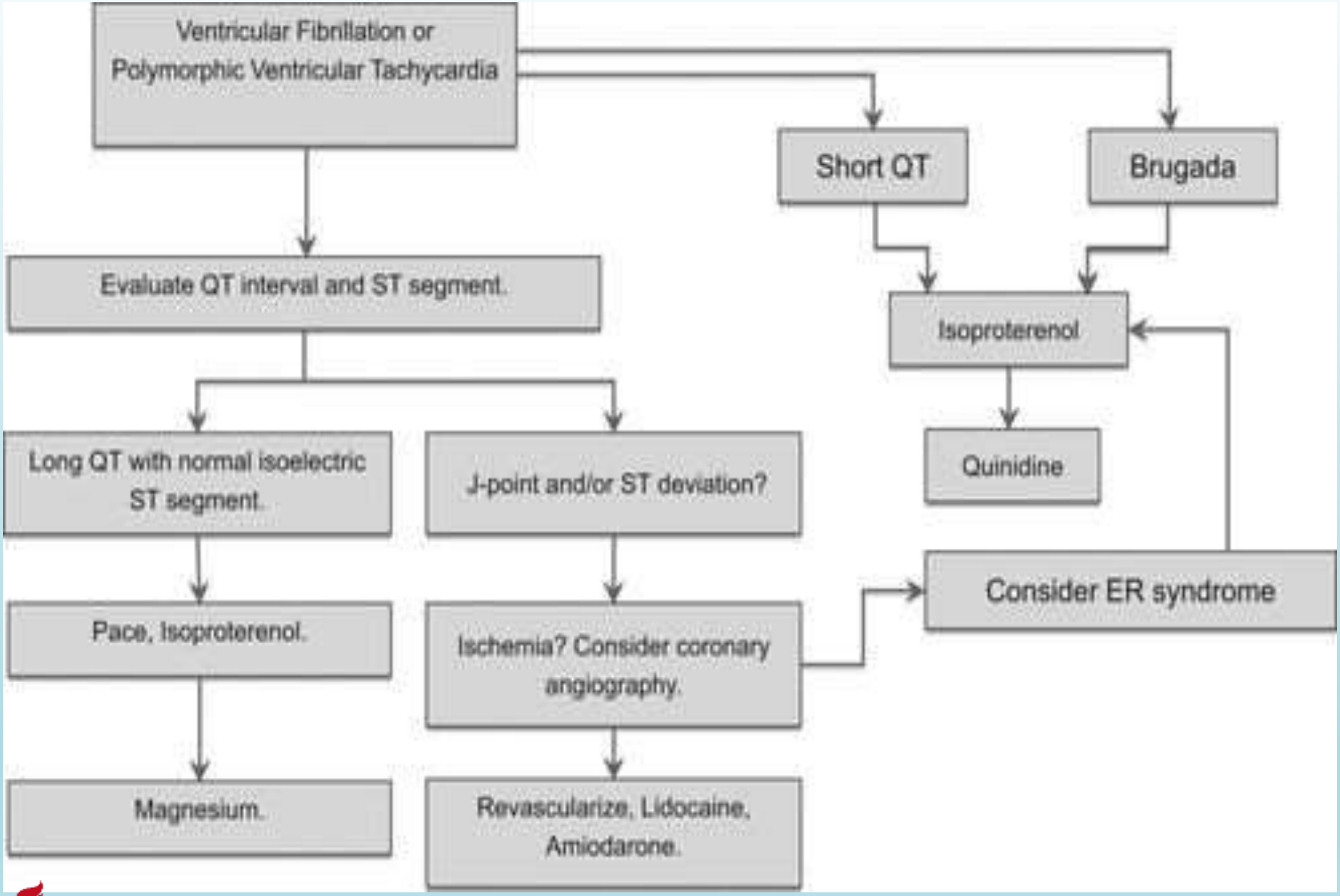
Qual'e' il rischio della ER?

The incidental discovery of a J wave on routine screening should not be interpreted as a marker of "high risk" for SCD because the odds for this fatal disease are approximately 1:10,000.[229] Rosso et al indicated that the presence of a J wave on the ECG increases the probability of VF from 3.4:100,000 to 11:100,000.

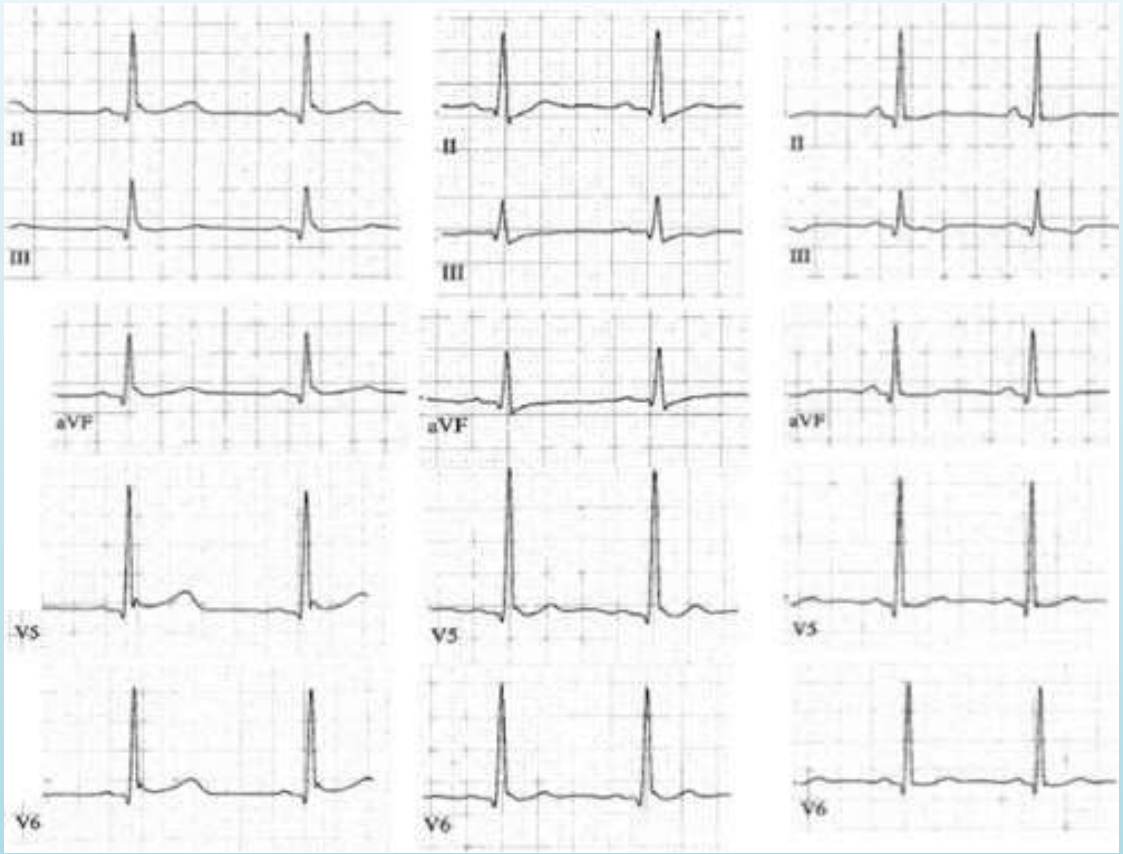
Study population.



Greg Mellor et al. Circ Arrhythm Electrophysiol. 2016;9:e003960



Manoj N. Obeyesekere. Circulation. A Clinical Approach to Early Repolarization, Volume: 127, Issue: 15, Pages: 1620-1629, DOI: (10.1161/CIRCULATIONAHA.112.143149)

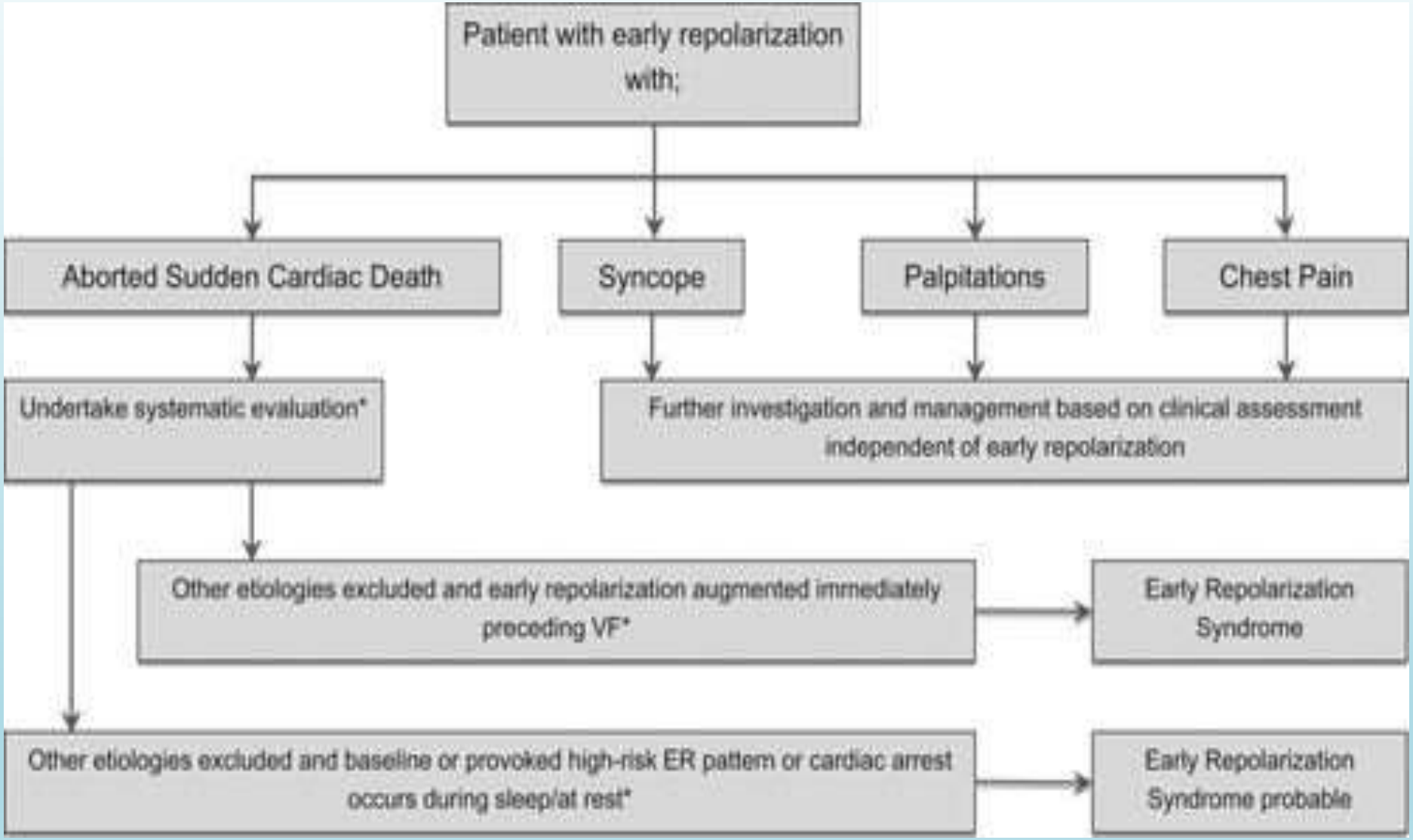


Manoj N. Obeyesekere. Circulation. A Clinical Approach to Early Repolarization, Volume: 127, Issue: 15, Pages: 1620-1629, DOI: (10.1161/CIRCULATIONAHA.112.143149)

- ✓ ER pattern is not associated with incidence of threatening arrhythmias or adverse clinical events over a medium follow-up period.

- ✓ Therefore, no additional testing are required in case of isolated J-wave/ST elevation in a trained athlete.

APPROCCIO DIAGNOSTICO



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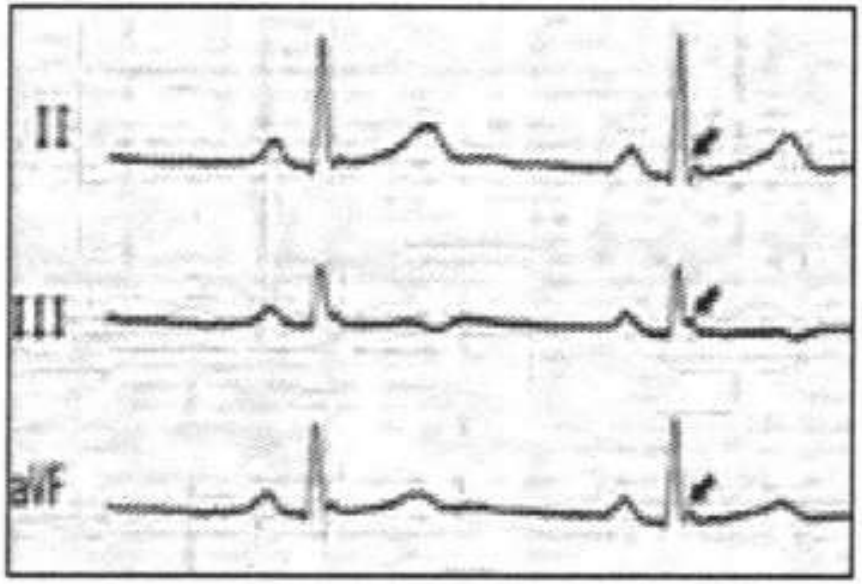
RP MALIGNA : ASSENZA DI SOPRASLIVELLAMENTO ST

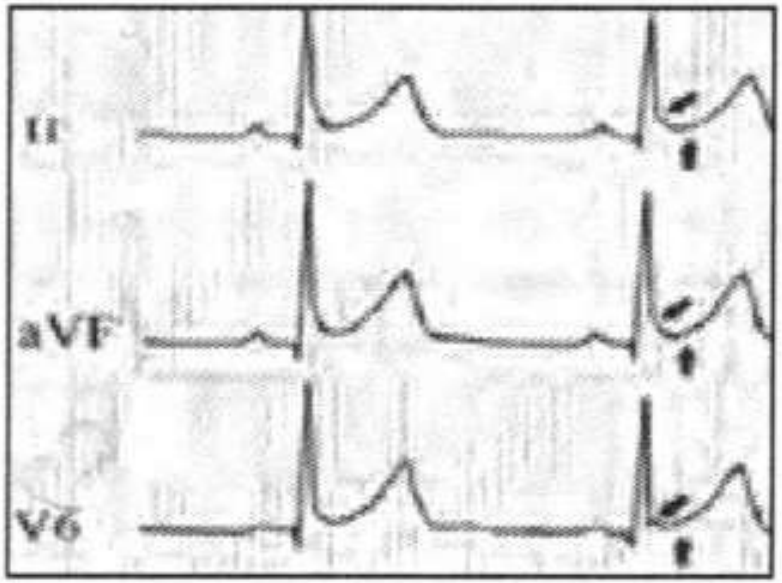
Alterazioni della ripolarizzazione nell'atleta

Pattern ERP in fibrillazione V.I.



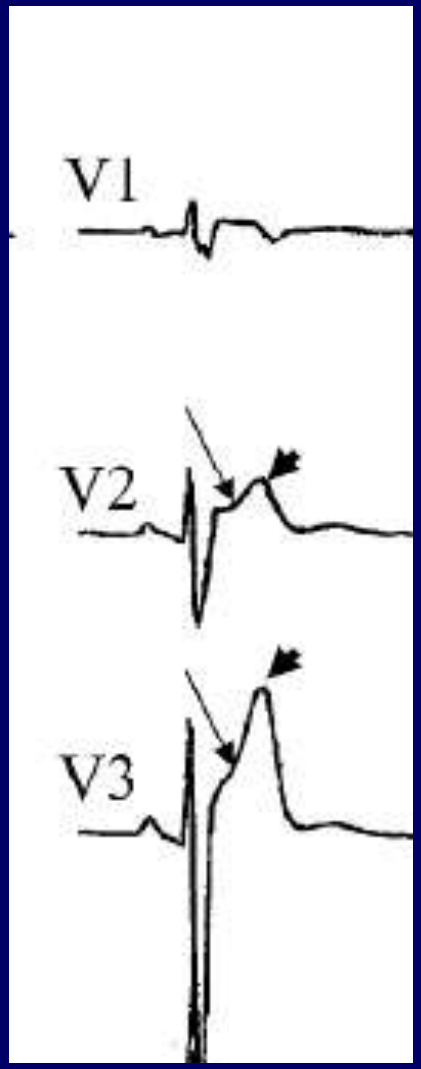
a

Pattern ERP degli atleti

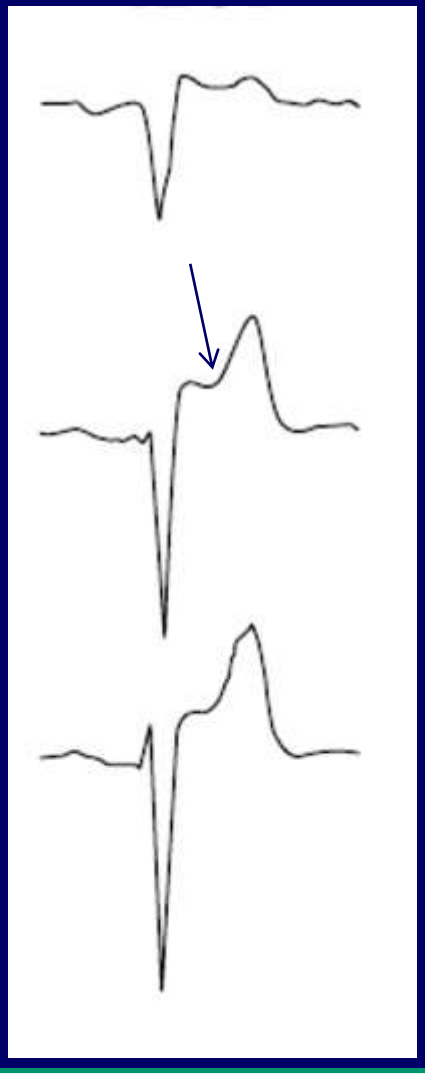


b

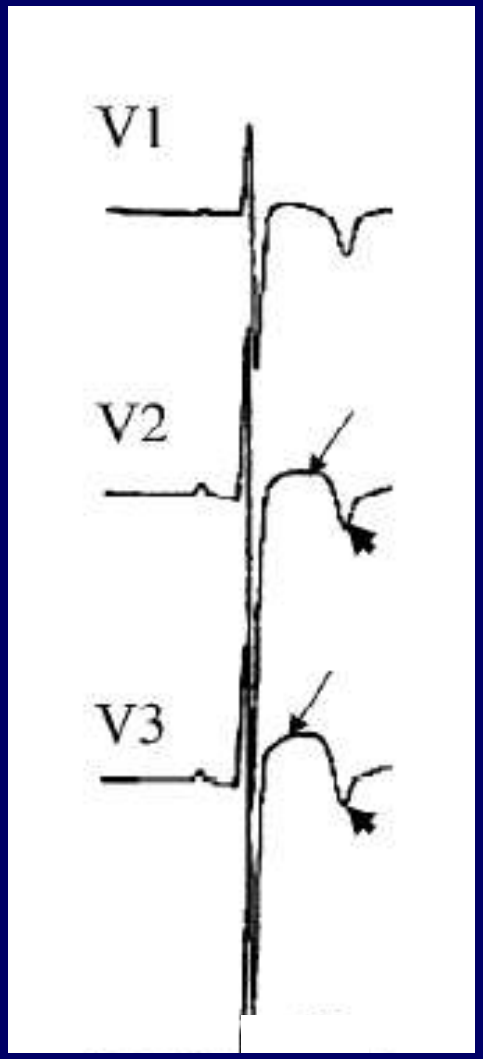
RVP tipo A



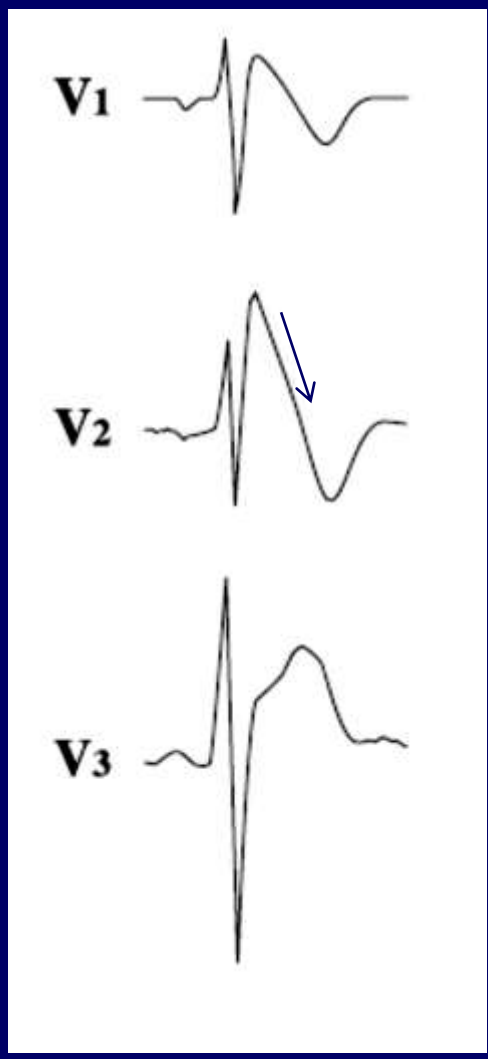
Br tipo 2



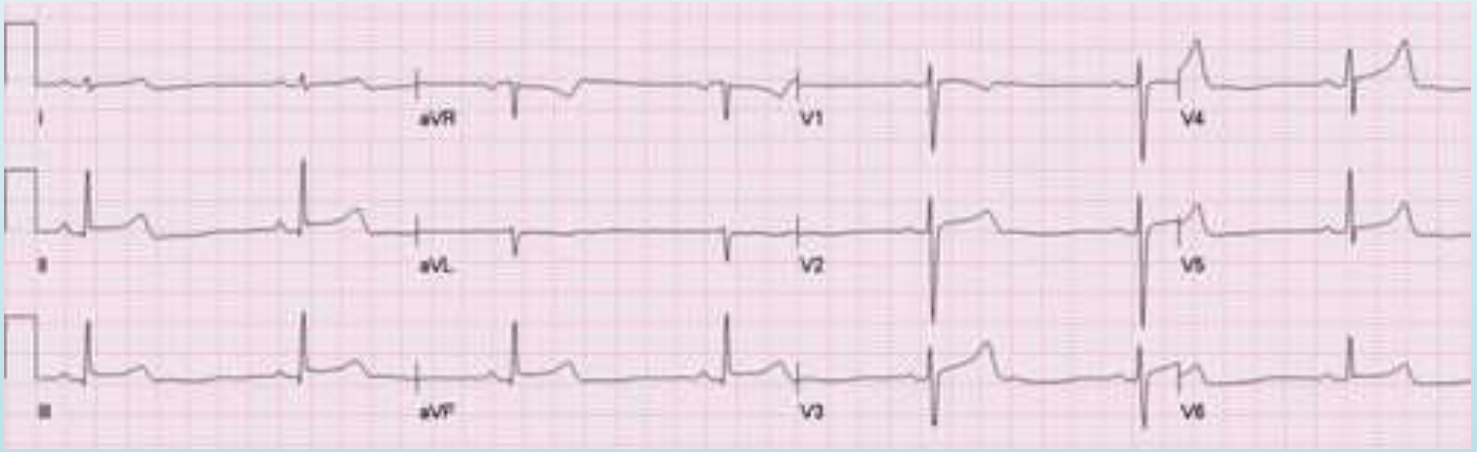
RVP tipo B



Br tipo 1



Diagnosi differenziale tra RVP destra benigna e pattern di Brugada



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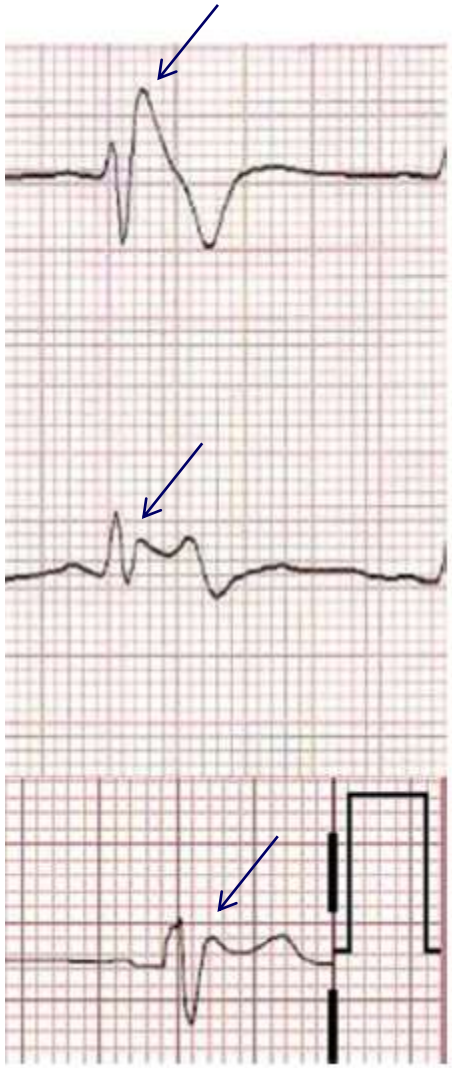
Veerakul G, Nademanee K 2012

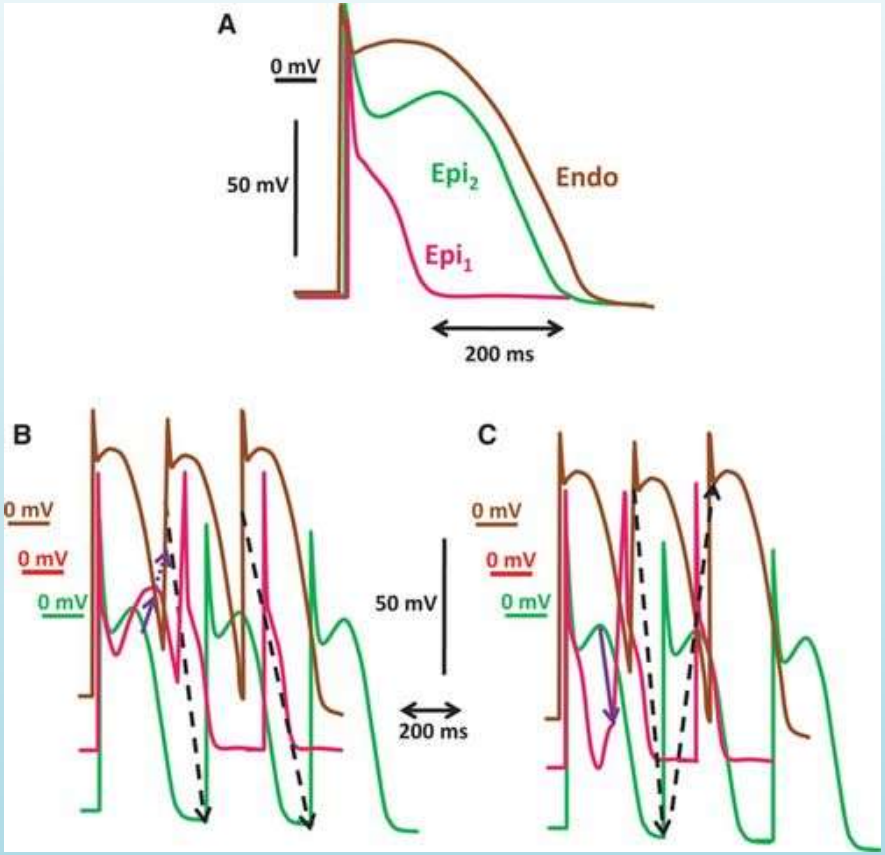
	J point >/=2mm	ST />= 2mm
Type 1 Brugada Pattern	YES	YES
Type 2 Brugada Pattern	YES	YES
Type 3 Brugada Pattern	YES	NO



Ripolarizzazione ventricolare precoce senza ST sopra

- In assenza di fattori di rischio (sincope, BPV precoci, familiarita' per RVP maligna, morte improvvisa giovanile ecc.) non e'consentito diagnosticare una RVP maligna
- Il riscontro di RVP senza ST sopra asintomatica aumenta il rischio di FV da 3.4x100.000 a11x100.000

Manoj N. Obeyesekere. Circulation. A Clinical Approach to Early Repolarization, Volume: 127, Issue: 15, Pages: 1620-1629, DOI: (10.1161/CIRCULATIONAHA.112.143149)



Manoj N. Obeyesekere. Circulation. A Clinical Approach to Early Repolarization, Volume: 127, Issue: 15, Pages: 1620-1629, DOI: (10.1161/CIRCULATIONAHA.112.143149)

Sudden cardiac death associated with early repolarization

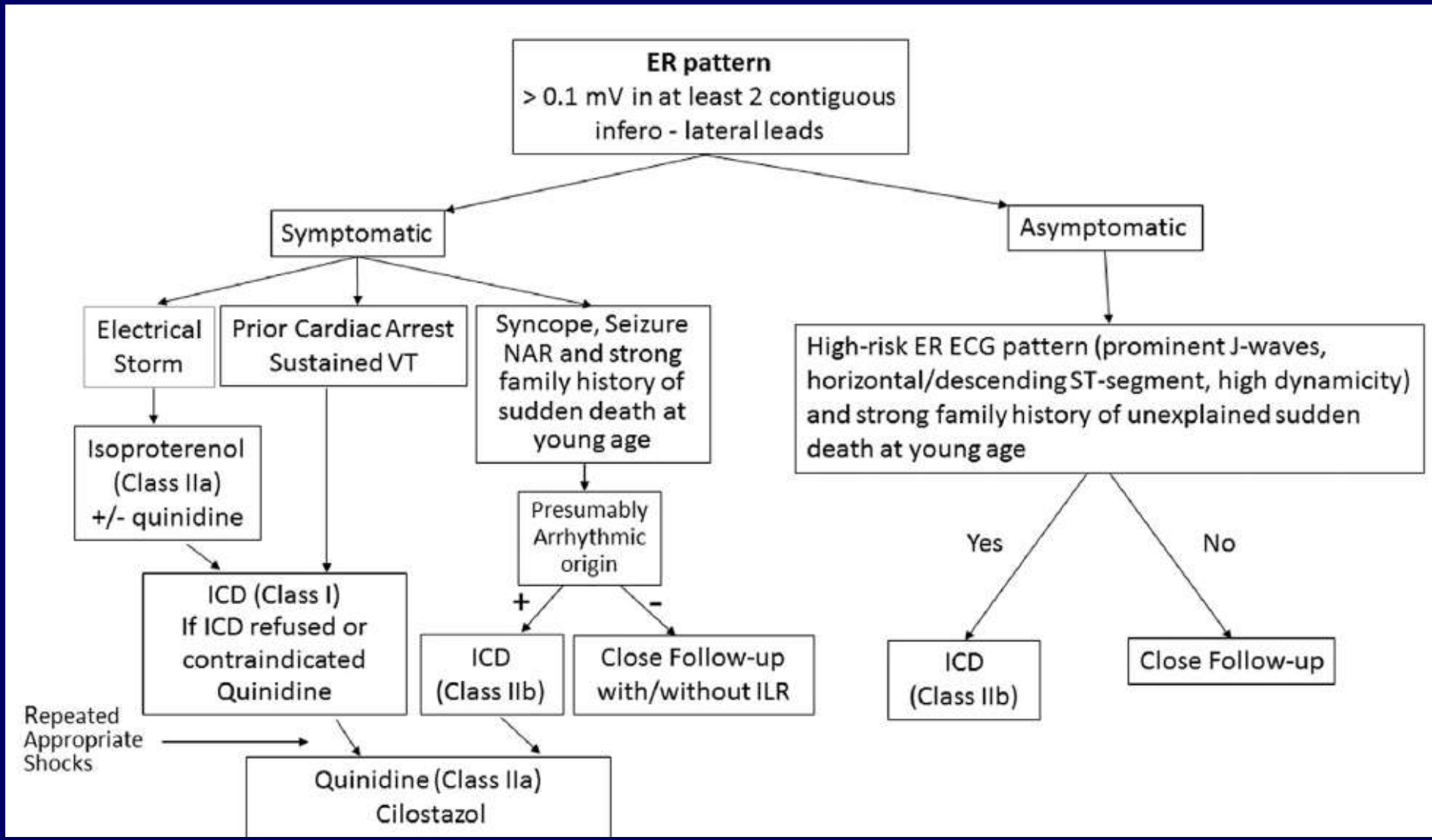
Haissaguerre M et al N Engl J Med 2008; 358:2016-23

Atleti esclusi dalla casistica

	F.V. idiopatica n.206	Controlli n.412
•M/F	123/83	270/142
•Eta’	36+/-11	36+/-12
•Ripolarizzazione ventricolare precoce	31%	5%
	P<0.001	

COSA FARE NELLA ER POTENZIALMENTE MALIGNA

Antzelevich eta l, Heart Rhythm 2016



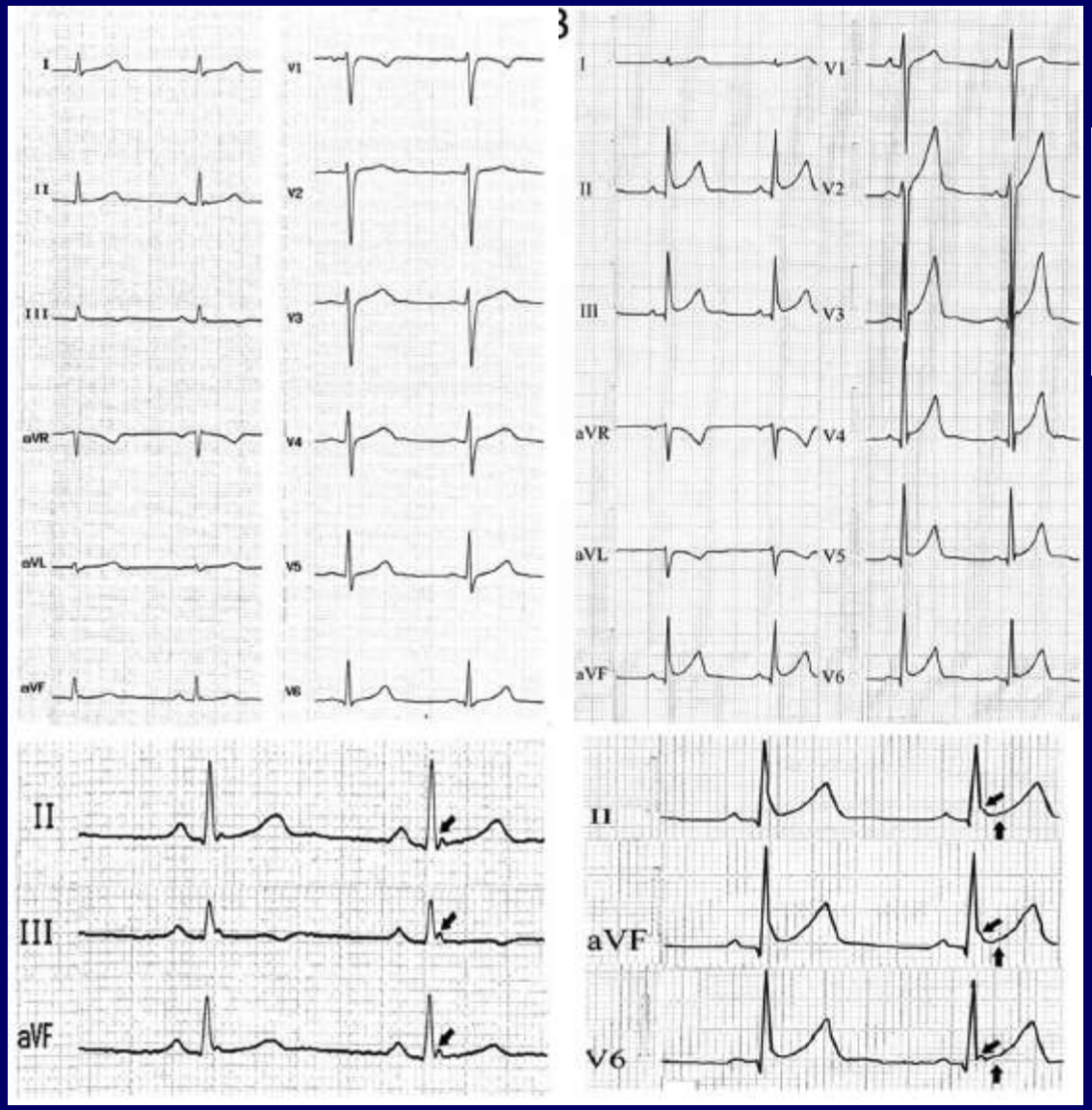
J Wave, QRS Slurring, and ST Elevation in Athletes With Cardiac Arrest in the Absence of Heart Disease

Marker of Risk or Innocent Bystander?

Riccardo Cappato, MD; Francesco Furlanello, MD; Valerio Giovinazzo, MD; Tommaso Infusino, MD;

21 aa, calcio
Arresto
cardiaco

29 aa
Ciclismo
asintomatico

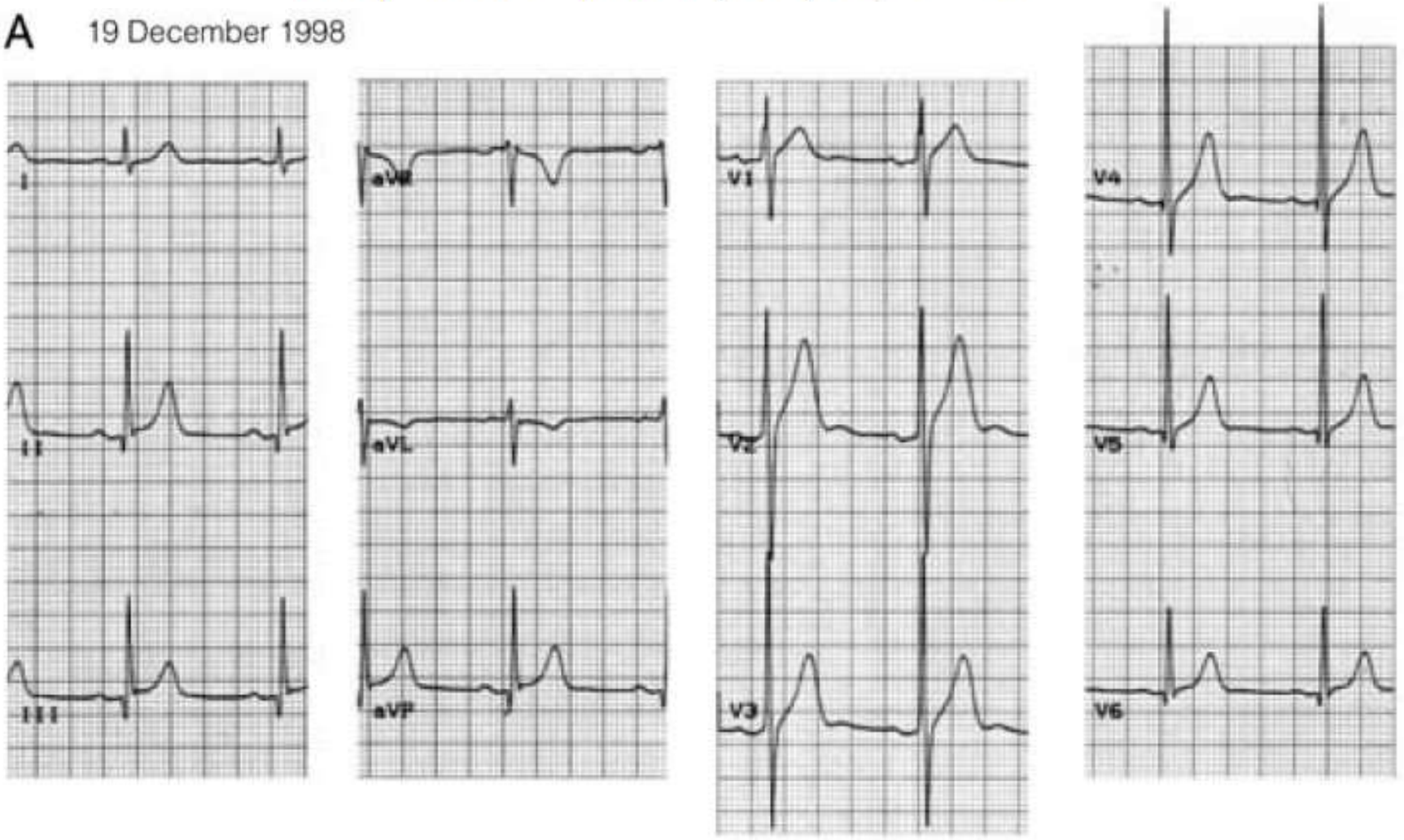


Senza
ST sopra

Con
ST sopra

Mode of onset of ventricular fibrillation in patients with early repolarization pattern vs. Brugada syndrome

European Heart Journal (2010) **31**, 330–339



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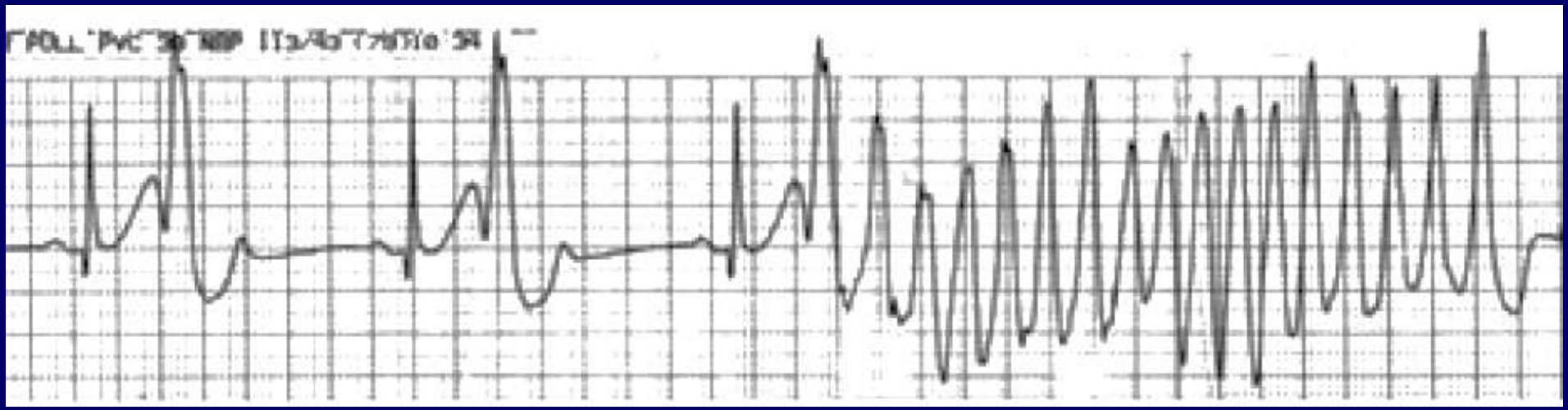
Mode of onset of ventricular fibrillation in patients with early repolarization pattern vs. Brugada syndrome

European Heart Journal (2010) **31**, 330–339

D 10:46 a.m. 18 August 2003



J-Wave syndromes expert consensus conference report: Emerging concepts and gaps in knowledge

Antzelevich et al, Heart Rhythm 2016

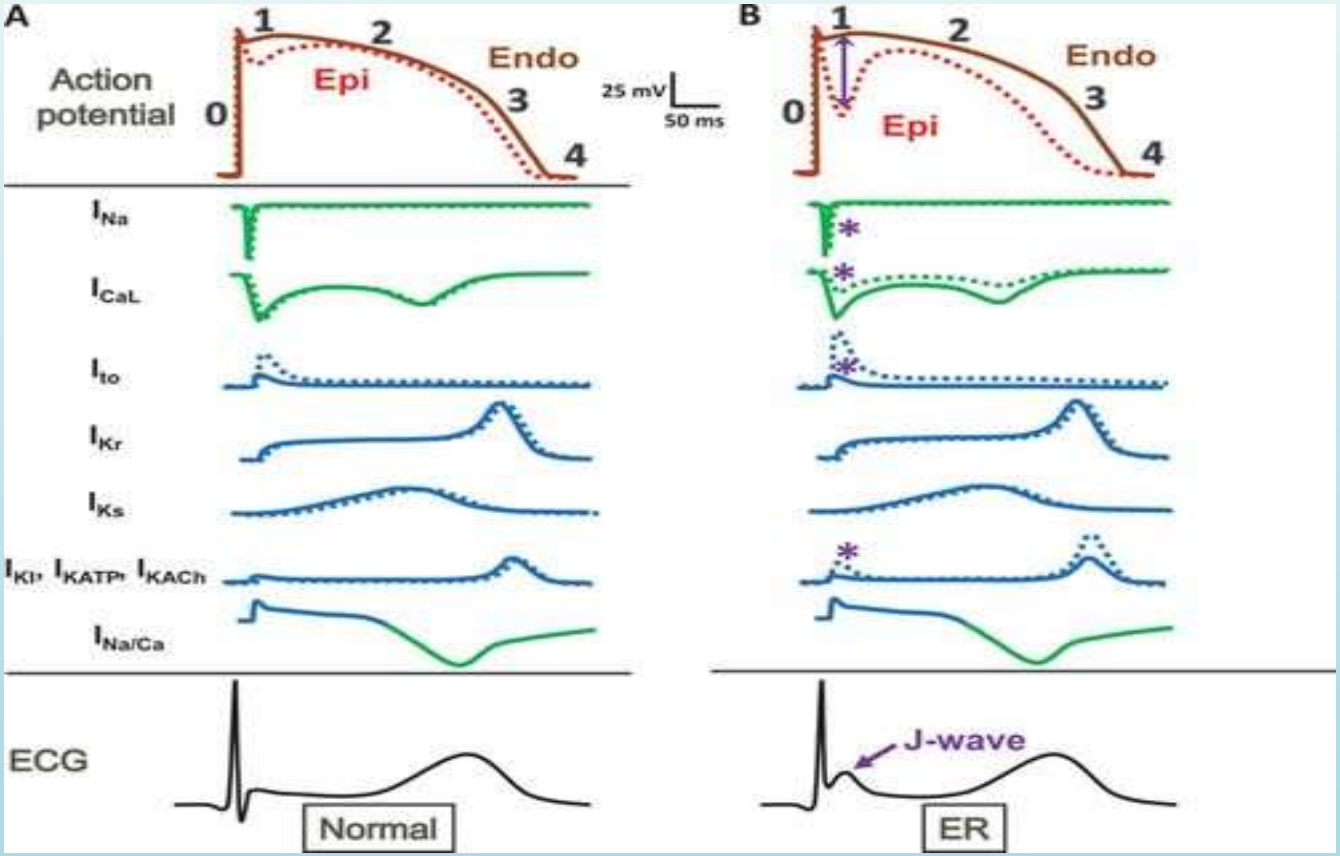
Score per la diagnosi di ER

- Probabile 5 ;possibile 3-4.5; non sufficiente: 0-2

II. Twelve-Lead ECG

A. ER ≥0.2 mV in ≥2 inferior and/or lateral ECG leads with horizontal/descending ST segment

2 points



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