J Nokta Yüksekliği (Erken Repolarizasyon)

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Erken Repolarizasyon; J wave; Osborn wave; Haissaguerre s.

Experimental Hypothermia: Respiratory and Blood pH Changes in Relation to Cardiac Function

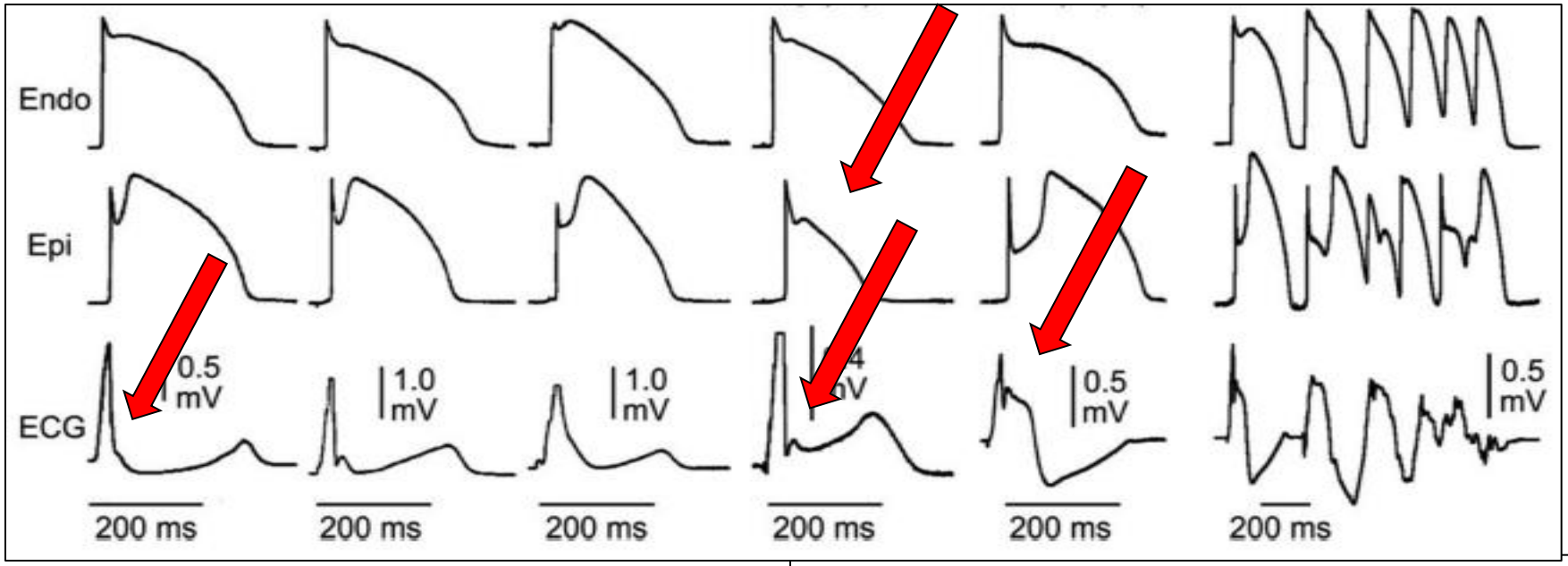
JOHN J. OSBORN[1]

From the Department of Pediatrics, New York University College of Medicine, New York City

TEMPORARY whole-body hypothermia in theory offers an ideal way of greatly reducing metabolism, and seems to hold great promise in clinical surgery. Yet, although the reptile or the hibernating mammal can withstand very low body temperatures without distress, body temperatures much below 28°C produce severe and often fatal physiological stress in the non-hibernating mammal.

In the course of a series of studies of the physiology of experimental hypothermia in

volume was measured directly in several ways, eventually by passage through a recording dry-type gas-meter. The expired air was collected, and in earlier dogs was passed continuously through a modified Marriott bicarbonate buffer solution (2) with indicator dye to provide an estimation of CO_2 concentration. In later experiments, CO_2 concentration of expired air was measured by thermal conductivity in an appropriate pair of cells and gas-train (3). Positive pressure respiration in controllable amount was administered when necessary by means of a Starling pump through a balloon tracheal catheter. Samples of the blood serum were analyzed for CO_2 content and electrolytes by standard clinical laboratory procedures.



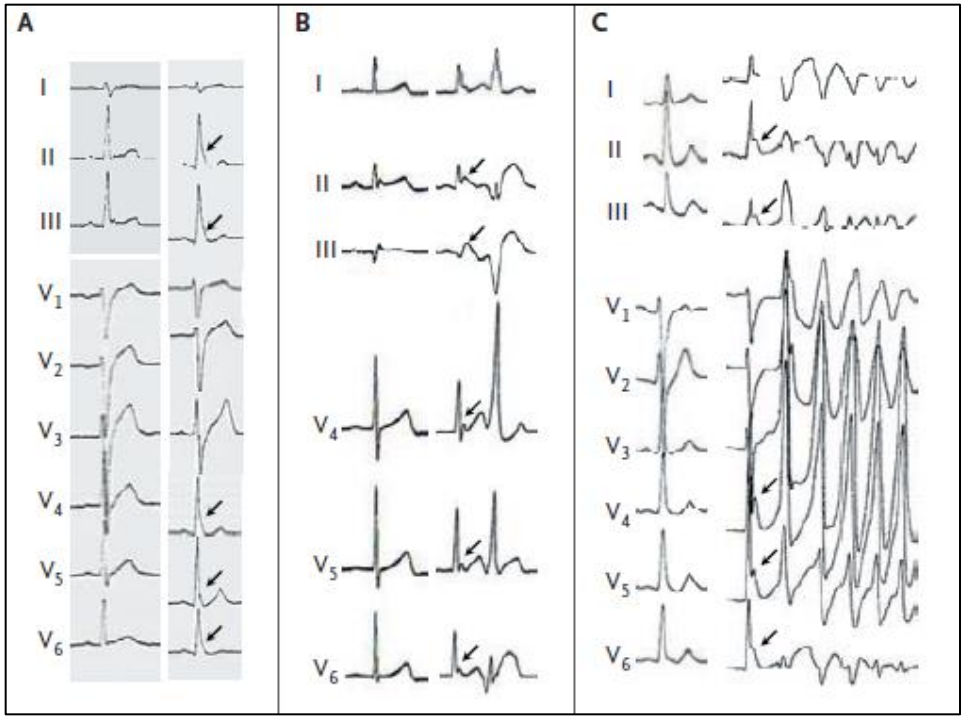
Osborn JJ.Experimental hypothermia;respiratory and blood pH changes in relation to cardiac function. AmJPhysiol 1953;175:389–398

Erken Repolarizasyon tanım

Sudden Cardiac Arrest Associated with Early Repolarization

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

N ENGL J MED 358;19 WWW.NEJM.ORG MAY 8, 2008



206 VF+ ➔ % 30 inferolateral ST elev.> 1mm (slur/notch)

*% 42, **% 58

* Rosso R, Kogan E, Belhassen B, et al. J-point elevation in survivors of primary ventricular fibrillation and matched control subjects. J Am Coll Cardiol 2008;52:1231.
** Nam GB, Ko KH, Kim J, et al. Mode of onset of ventricular fibrillation in patients with early repolarization pattern vs. Brugada syndrome. Eur Heart J 2010;31:330.

Erken Repolarizasyon tanı

HRS/EHRA/APHRS 2013

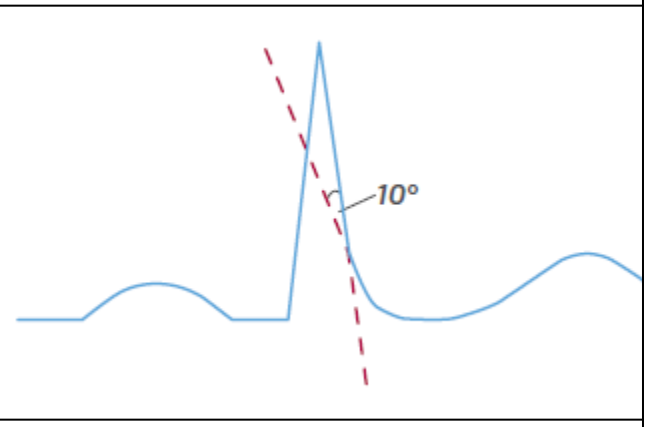
6. Early Repolarization (ER) *Expert Consensus Recommendations on Early Repolarization Diagnosis*

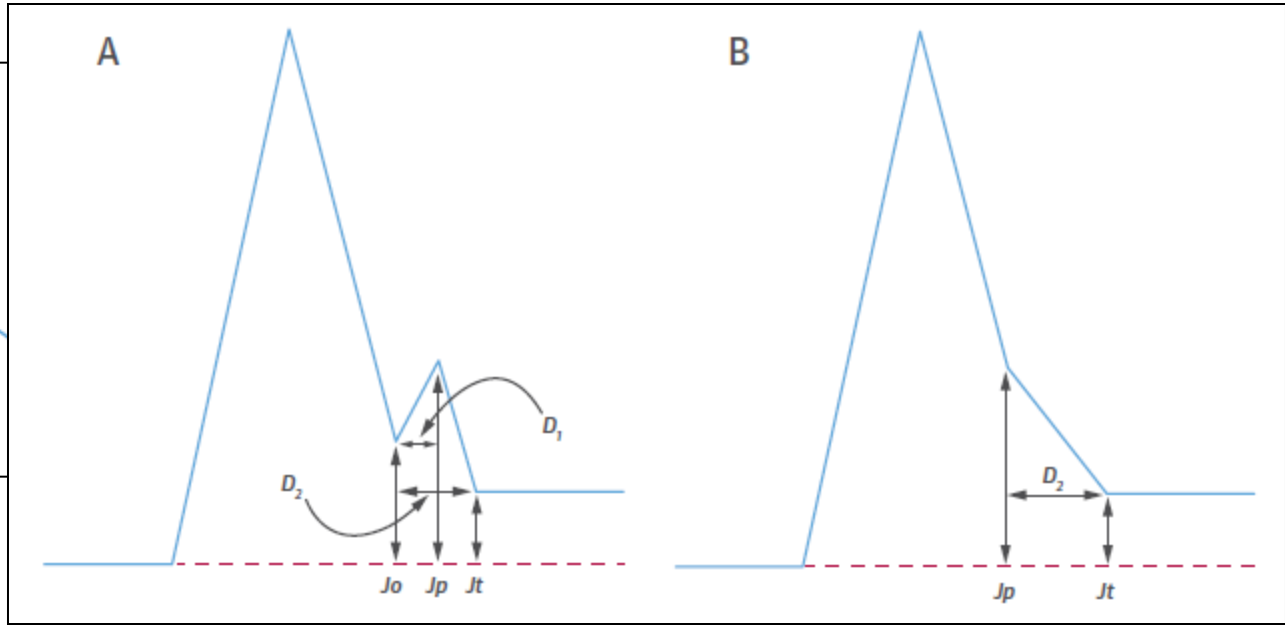
1. ER ***syndrome is diagnosed*** in the presence of J-point elevation ≥1 mm in ≥2 contiguous inferior and/or lateral leads of a standard 12-lead ECG in a patient resuscitated from otherwise unexplained VF/polymorphic VT
2. ER syndrome ***can be diagnosed*** in an SCD victim with a negative autopsy and medical chart review with a previous ECG demonstrating J-point elevation ≥1 mm in ≥2 contiguous inferior and/or lateral leads of a standard 12-lead ECG
3. ER pattern ***can be diagnosed*** in the presence of J-point elevation ≥1 mm in ≥2 contiguous inferior and/or lateral leads of a standard 12-lead ECG

Erken Repolarizasyon ?

Erken repolarizasyon ✖ ST segment yükselmesi

1. R dalgası-QRS sonunda çentik veya 'slur',
   slur başlangıcı ve çentik baseline üzerinde
2. Jp ≥ 0.1 mV
3. QRS< 120 ms



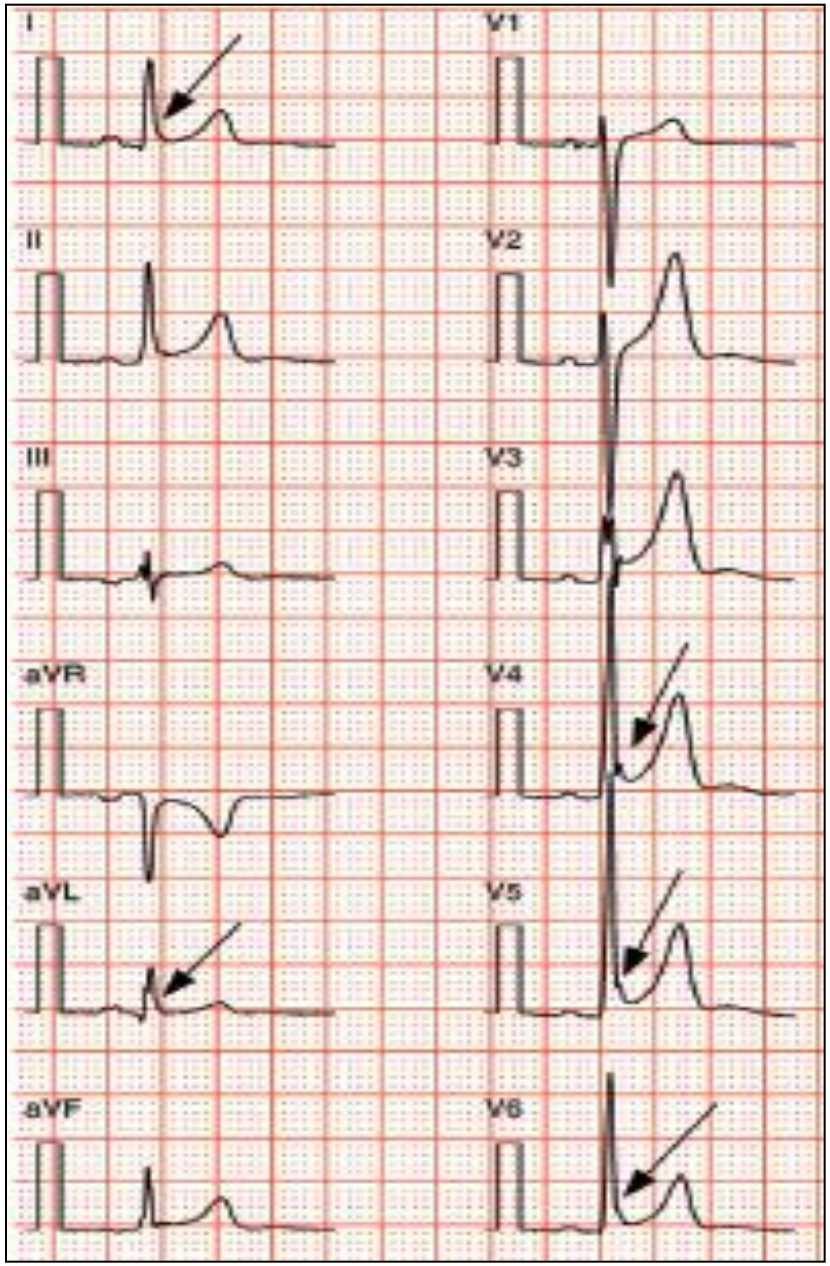


The Early Repolarization Pattern

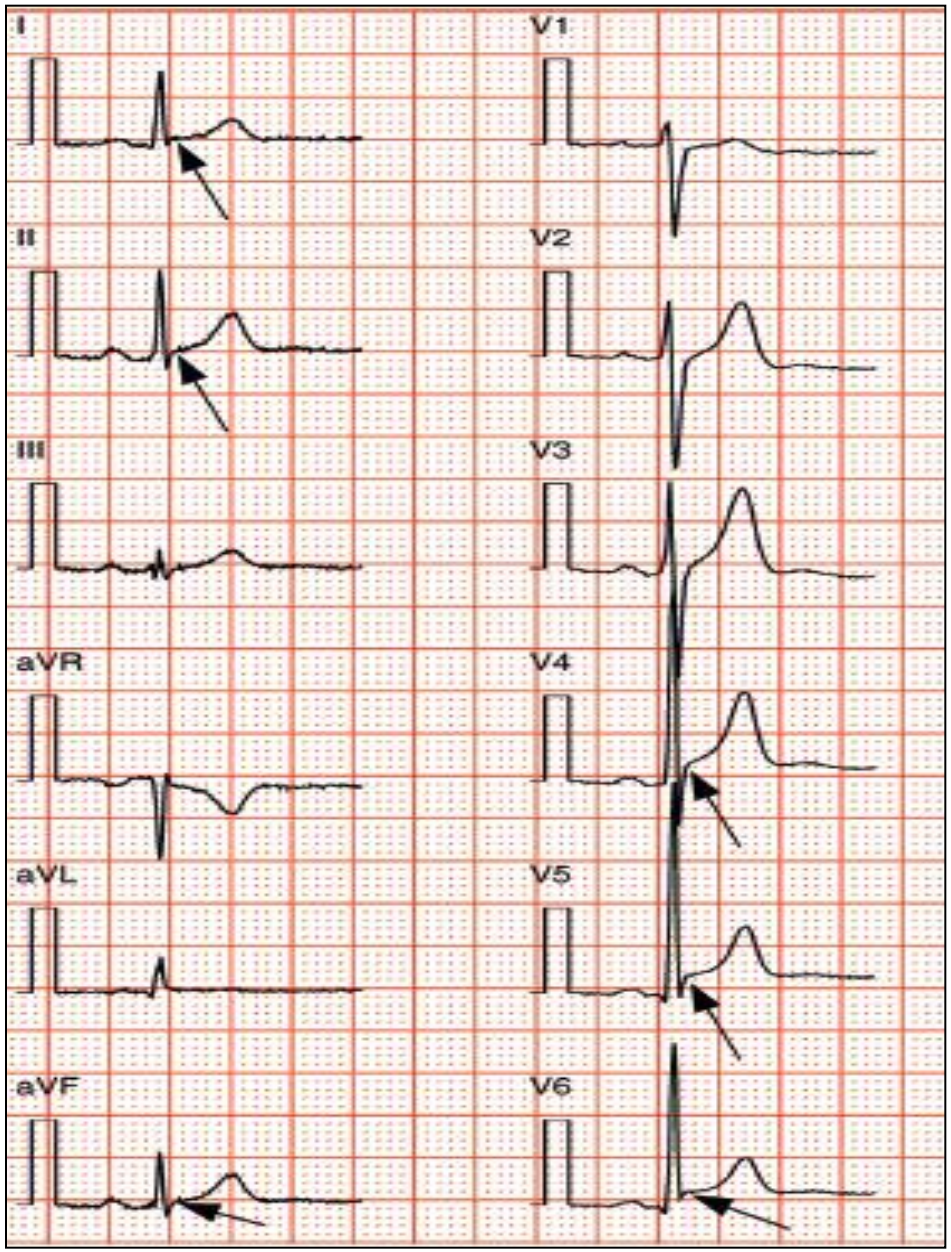
A Consensus Paper

JACC VOL. 66, NO. 4, 2015

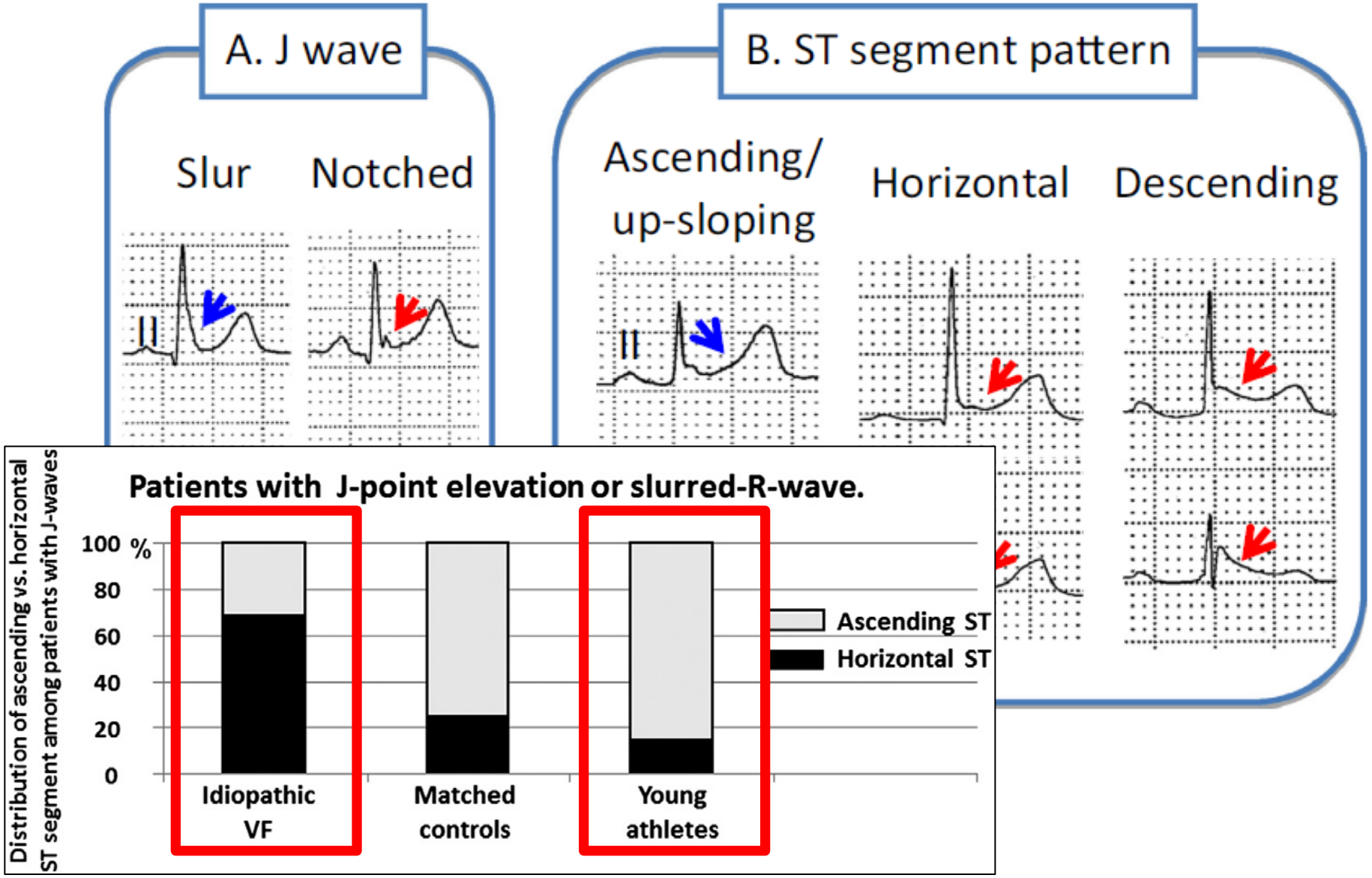
ER



Non spesifik



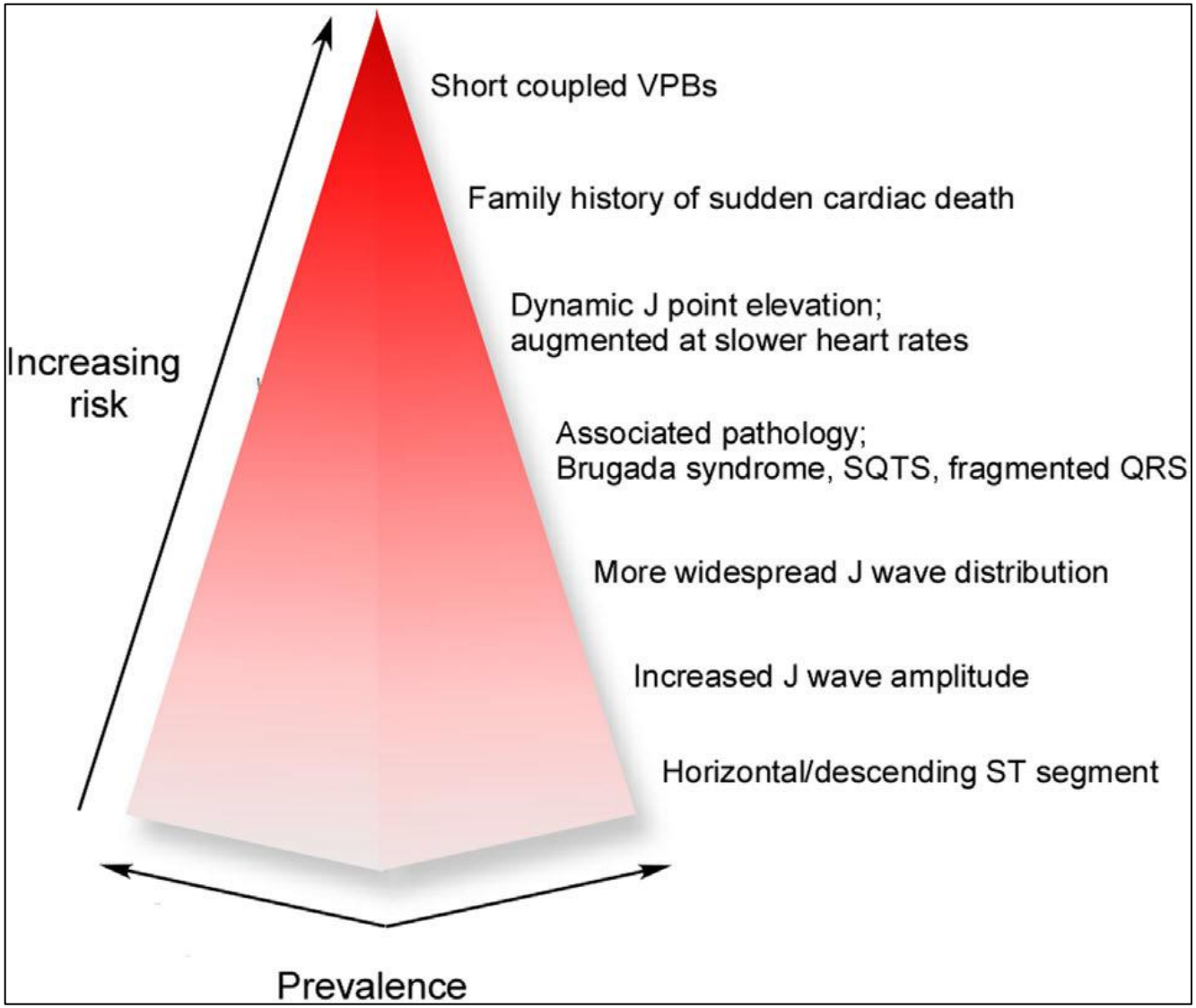
Erken Repolarizasyon tipleri



Tikkanen JT et al. Circulation2011;123:2666-2673

J Am Coll Cardiol 2013;62:863–8)

Erken Repolarizasyonda risk sınıflaması



Erken Repolarizasyonda risk sınıflaması

- Senkop öyküsü olan hastalar
  - KA öyküsü olan hastaların > 1/3 ünde senkop +
  - Vagal durum baskınken senkop➔ dinlenme, uykuda agonal solunum

- Aile öyküsü➔ VF li olguların % 14 ünde aile öyküsü +

N Engl J Med 2008;358:2016-23

- Pause dependent dinamik j dalgası

Circulation2011;123:2666–2673.

Early Repolarization Pattern and Risk for Arrhythmia Death

A Meta-Analysis

J Am Coll Cardiol 2013;61:645–50

Tikkanen JT et al. Circulation2011;123:2666–2673

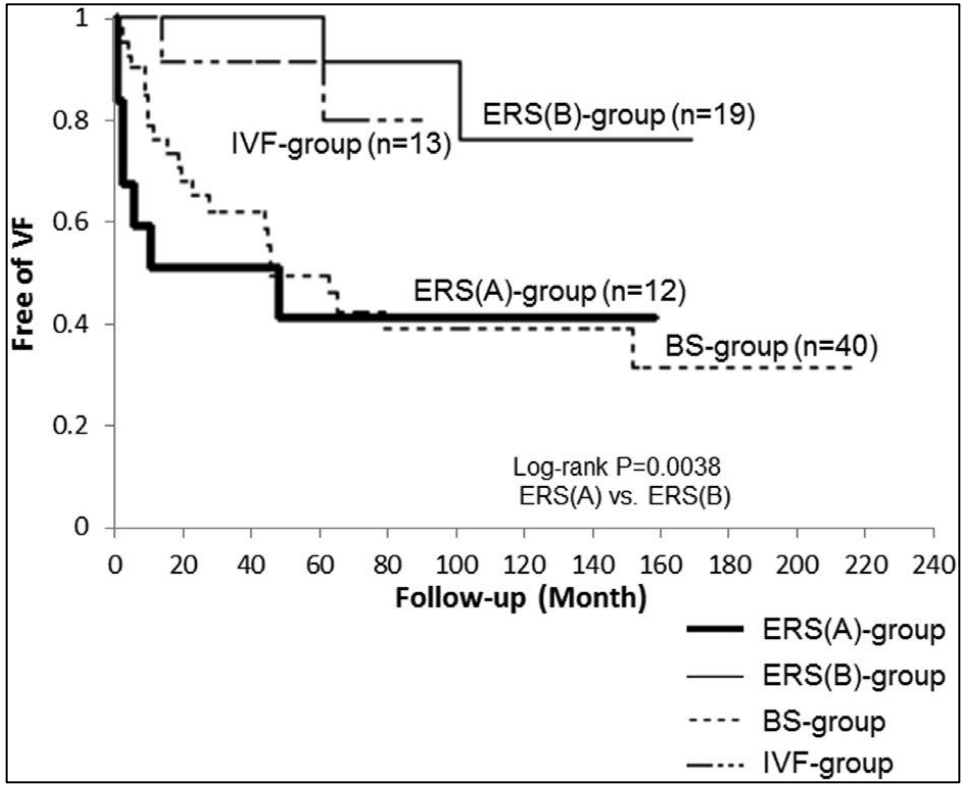
Tikkanen JT et al. NEnglJMed2009;361:2529–2537.

- > 0,2 mV J elev. ➔ Yüksek risk

- > 0,2 mV j elev ➔ % 0,3 ER
- Dinamik j elev. ➔ Anlık EKG saptanamayabilir

Significance of Non-Type 1 Anterior Early Repolarization in Patients With Inferolateral Early Repolarization Syndrome

JACC Vol. 62, No. 17, 2013



84 VF olgu
31 ERS+

Pure inferolateral ERS 19 hasta

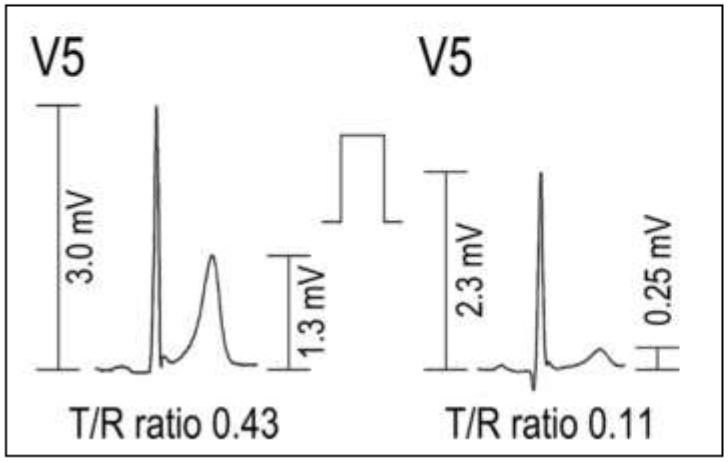
İnferolateral+V1-3 ERS 12 hasta

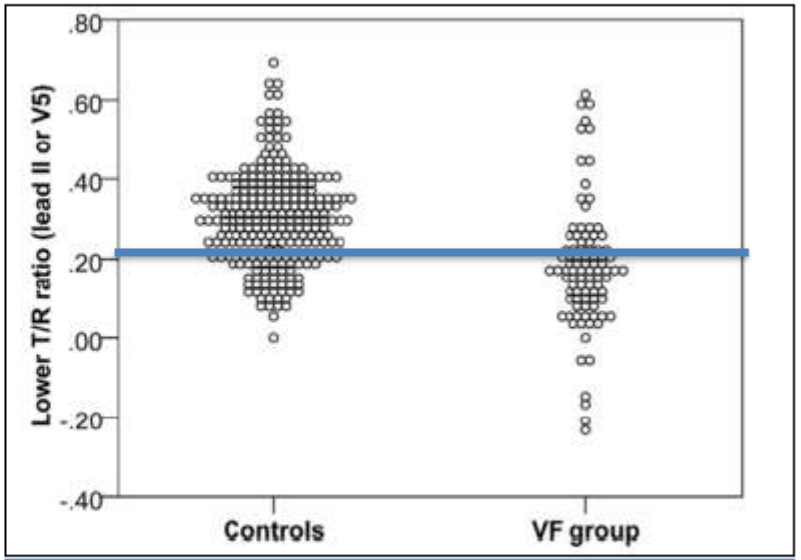
İL+Ant ERS➔ nüks VF+

Global Jp elev.+

T Wave instead of ST Segment?

Both groups ER	VF group (n=92)	Controls (n=247)
Presence of low amplitude T waves	27 (29%)	8 (3%)



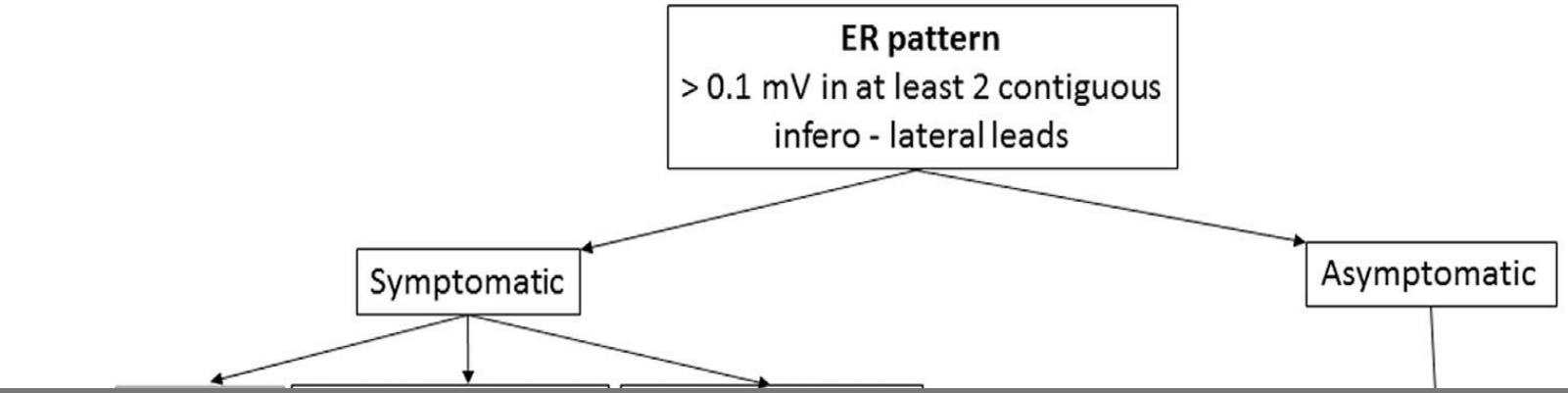


Lower T/R Ratio cut off 0.20
SN 61%; SP 81%

Roten et al., Heart Rhythm 2016;13:894–902

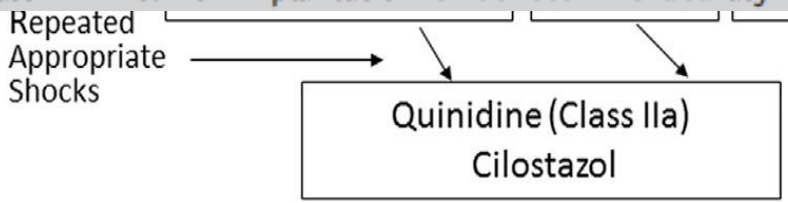
- Azalmış T/R oranı ➔ Artmış risk

Erken Repolarizasyon tedavi



Expert Consensus Recommendations on Early Repolarization Therapeutic Interventions

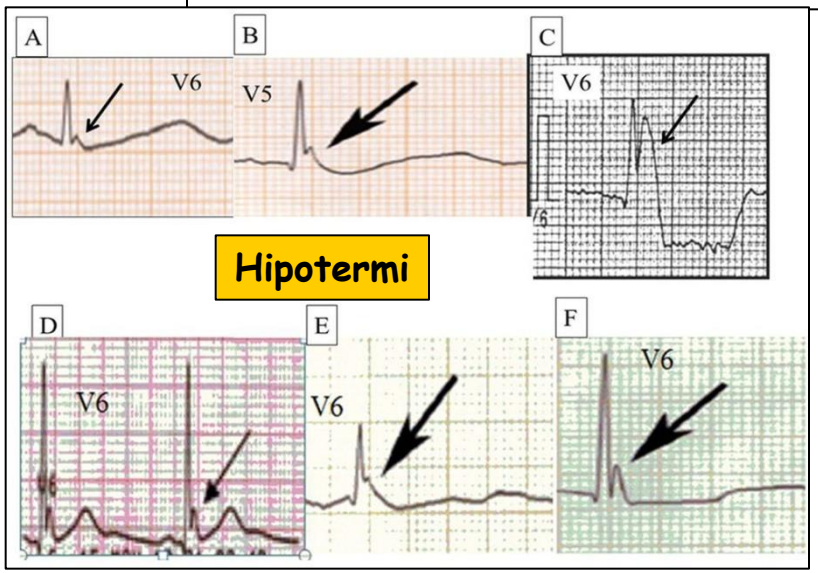
Class I	1. ICD implantation ***is recommended*** in patients with a diagnosis of ER syndrome who have survived a cardiac arrest.
Class IIa	2. Isoproterenol infusion ***can be useful*** in suppressing electrical storms in patients with a diagnosis of ER syndrome. 3. Quinidine in addition to an ICD ***can be useful*** for secondary prevention of VF in patients with a diagnosis of ER syndrome.
Class IIb	4. ICD implantation ***may be considered*** in symptomatic family members of ER syndrome patients with a history of syncope in the presence of ST-segment elevation >1 mm in 2 or more inferior or lateral leads. 5. ICD implantation ***may be considered*** in asymptomatic individuals who demonstrate a high-risk ER ECG pattern (high J-wave amplitude, horizontal/descending ST segment) in the presence of a strong family history of juvenile unexplained sudden death with or without a pathogenic mutation.
Class III	6. ICD implantation ***is not recommended*** asymptomatic patients with an isolated ER ECG pattern.

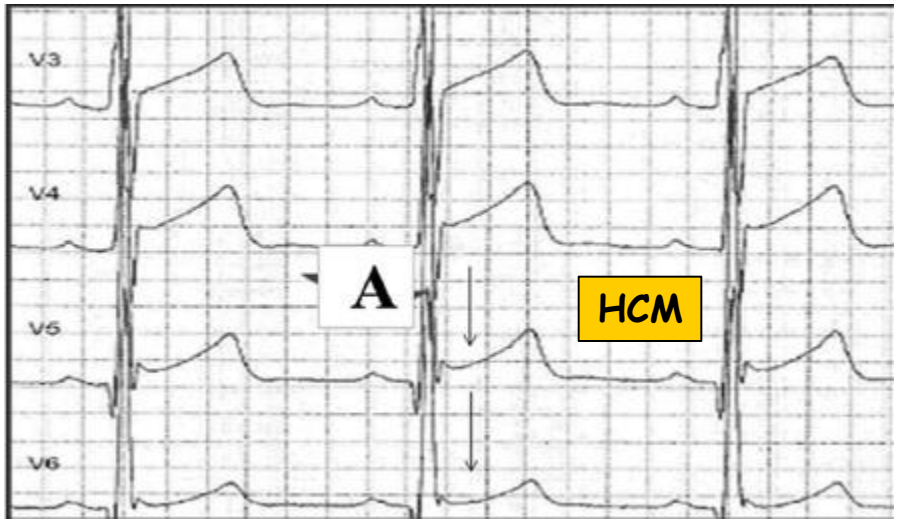


Some Controversies about Early Repolarization: The Haïssaguerre Syndrome

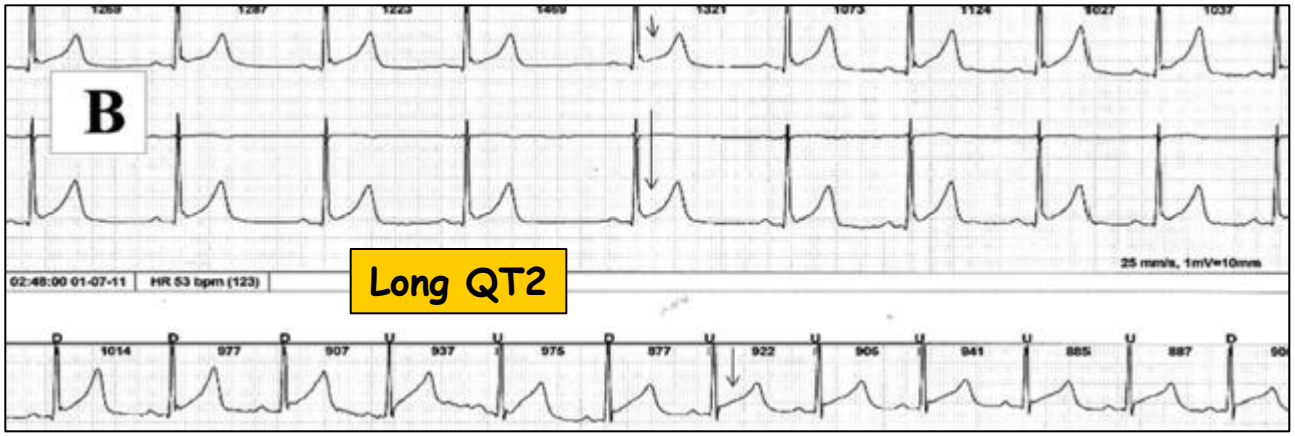
Peter Kukla, M.D., Ph.D.,* Marek Jastrzębski, M.D., Ph.D.,†
and Andrés Ricardo Pérez–Riera, M.D., Ph.D.‡

Ann Noninvasive Electrocardiol 2015;20(5):409–419





- ✓Hipokalemi
- ✓Hiperkalsemi
- ✓İskemi



Early repolarization pattern in the general population: Prevalence and associated factors

Guo-Zhe Sun, Ning Ye, Yin-Tao Chen, Ying Zhou, Zhao Li, Ying-Xian Sun *

G.-Z. Sun et al. / International Journal of Cardiology 230 (2017) 614–618

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.

N Engl J Med 2009;361:2529-37.

Genel populasyon➔ % 1.3-13

Genç
Erkek
Atlet
Afro-amerikan

} % 25~

İVF➔ 3,4/ 100.000

ERP➔%30-40➔ 1/100.000 ERP!!

100.000 olgu
ER prevalans %5➔ 5000
SCD ➔ 50
İVF ➔ 5
ER ➔ 2
10 Yıl ➔ 20

Is the J Wave or the ST Slope Malignant… or Neither?

JACC Vol. 63, No. 17, 2014
May 6, 2014:1808–13

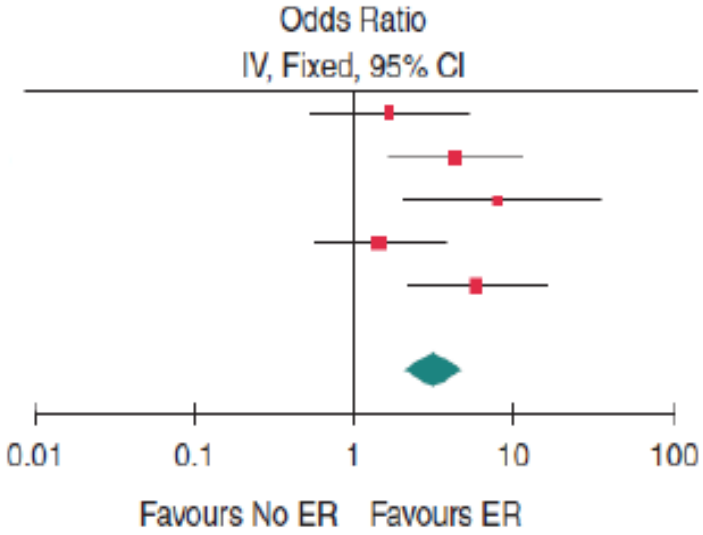
In light of these findings, should an ECG pattern that has never been shown to predict cardiovascular risk in any population studies until at least 15 years of follow-up really be considered "malignant"?

We also agree with Drs. Yong, Froelicher, and Wagner that "J waves" and "ST-segment elevation" have different implications, and we accordingly coined the term "early-repolarization package-deal" some time ago (5). It is imperative to identify high-risk

What is at stake by not resolving these issues? As pointed out by Martini et al. (10), we have already struggled with a syndrome for more than 25 years that has resulted in a "J-ICD reflex," often in response to a common ECG pattern. We need to examine whether it is truly the J-wave that heralds increased cardiovascular risk or whether this risk is attributable to other ECG abnormalities, with J waves merely the innocent bystander.

ER bir risk tamamlayıcı mı?

Brugada Syndrome



Odds ratio for the occurrence of arrhythmic events

Georgopoulos et al., Europace 2017

During Acute Coronary Syndrome

	Unadjusted OR	Adjusted OR
ER	1.85 (1.23–2.80)	1.77 (1.15–2.70)
ER +ascending ST segment	1.34 (0.61–2.98)	1.03 (0.46–2.32)
ER +horizontal ST segment	2.04 (1.25–3.34)	2.13 (1.29–3.52)

Odds Ratios of sudden cardiac death during acute coronary event

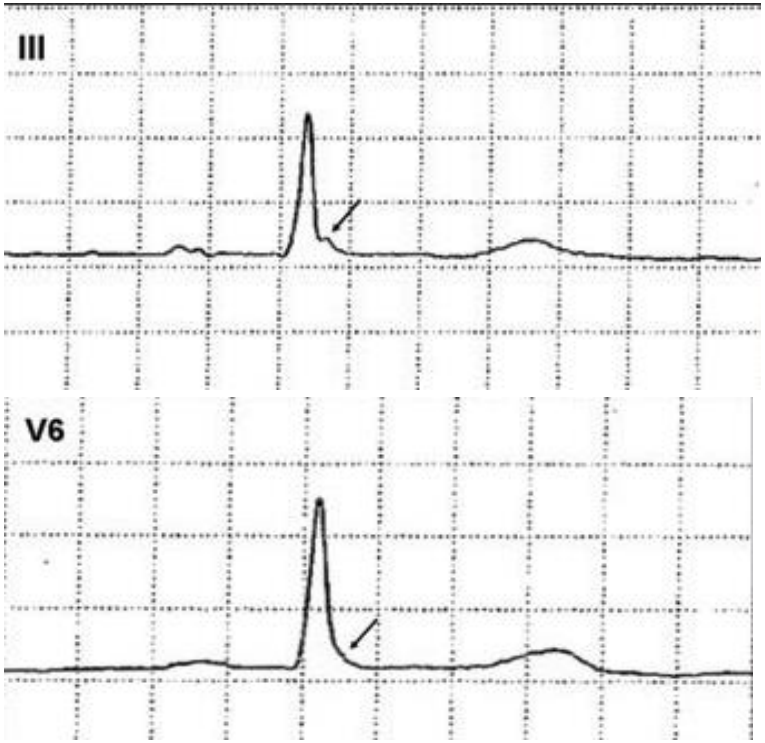
Tikkanen et al., Circ Arrhythm Electrophysiol. 2012;5:714-718

Early repolarization pattern: a marker of increased risk in patients with catecholaminergic polymorphic ventricular tachycardia

Europace (2016) **18**, 1587–1592

The present study shows that the early repolarization pattern (ERP) was present in a large proportion (45%) of catecholaminergic polymorphic ventricular tachycardia (CPVT) patients. ERP is a significant modifier of arrhythmic events in patients with CPVT. All patients with ERP were symptomatic at presentation, and the presence of ERP was related to increased frequency of syncope.

Available genetic screening data of 12 of 23 patients with ERP showed that all screened patients with ERP were positive for known mutations.



SONUÇ

2015 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

8.5 Early repolarization syndrome

8.5.1 Definitions and epidemiology

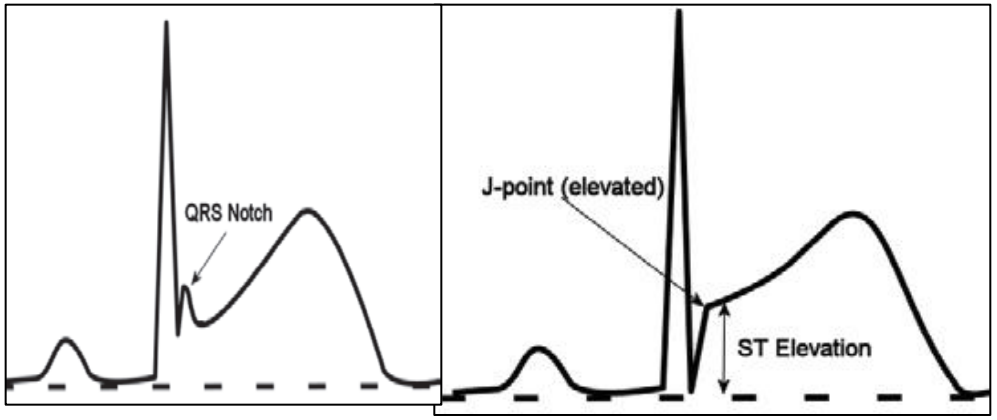
The presence of an early repolarization pattern in the inferior and/or lateral leads has been associated with idiopathic VF in case–control studies.[467,468] Owing to the high incidence of the early repolarization pattern in the general population, it seems reasonable to diagnose an 'early repolarization syndrome' only in patients with a pattern who are resuscitated from a documented episode of idiopathic VF and/or polymorphic VT.

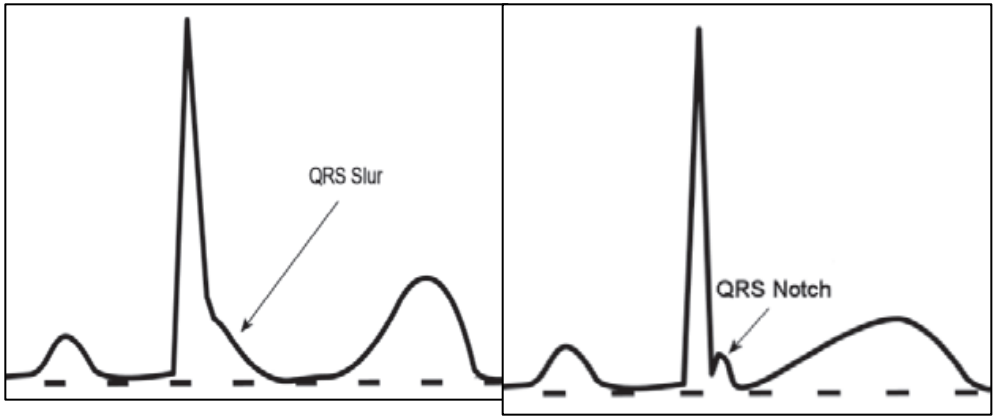
Given the uncertainties in the interpretation of the early repolarization pattern as a predictor of SCD, this panel of experts has decided that there is insufficient evidence to make recommendations for management of this condition at this time.

AHA Scientific Statement

Electrocardiographic Early Repolarization

A Scientific Statement From the American Heart Association





Circulation. 2016;133:1520-1529.

TEŞEKKÜR EDERİM