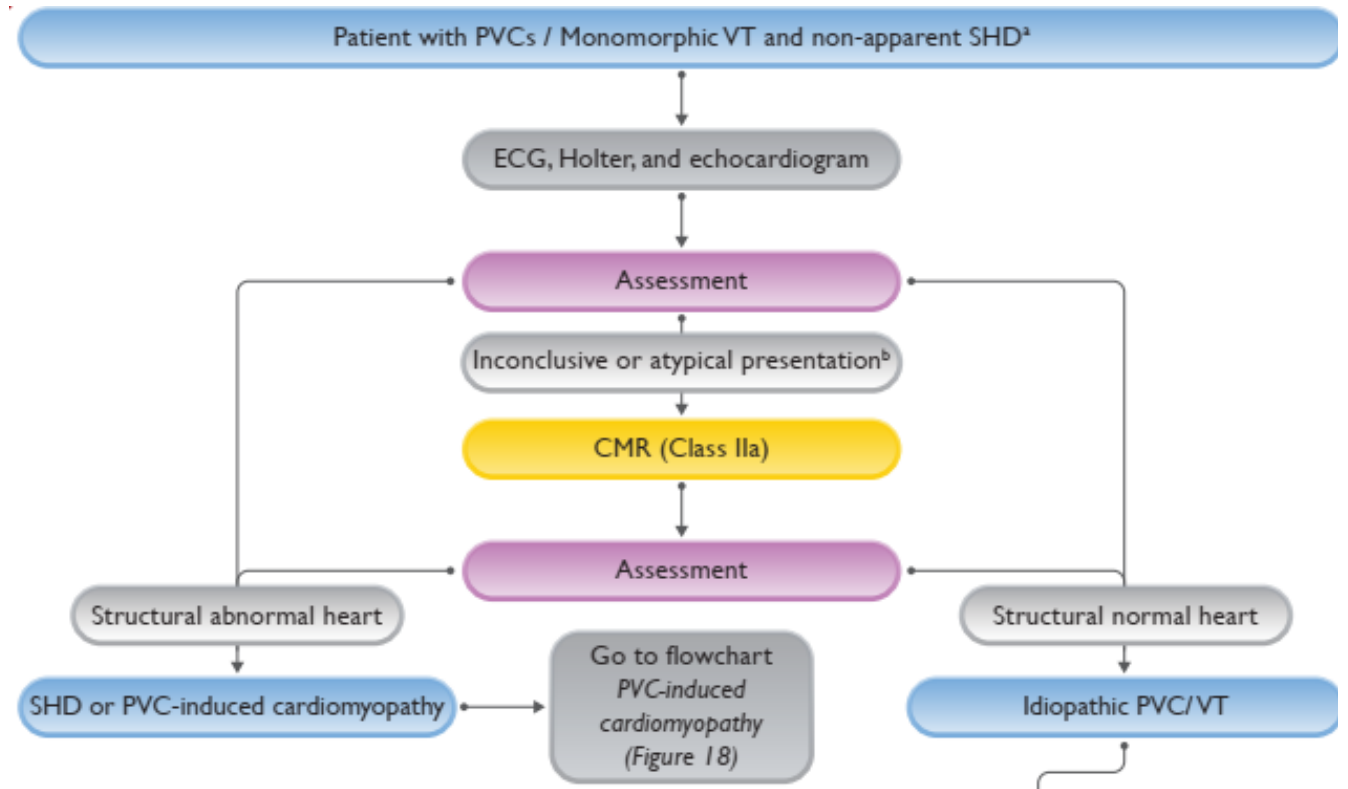


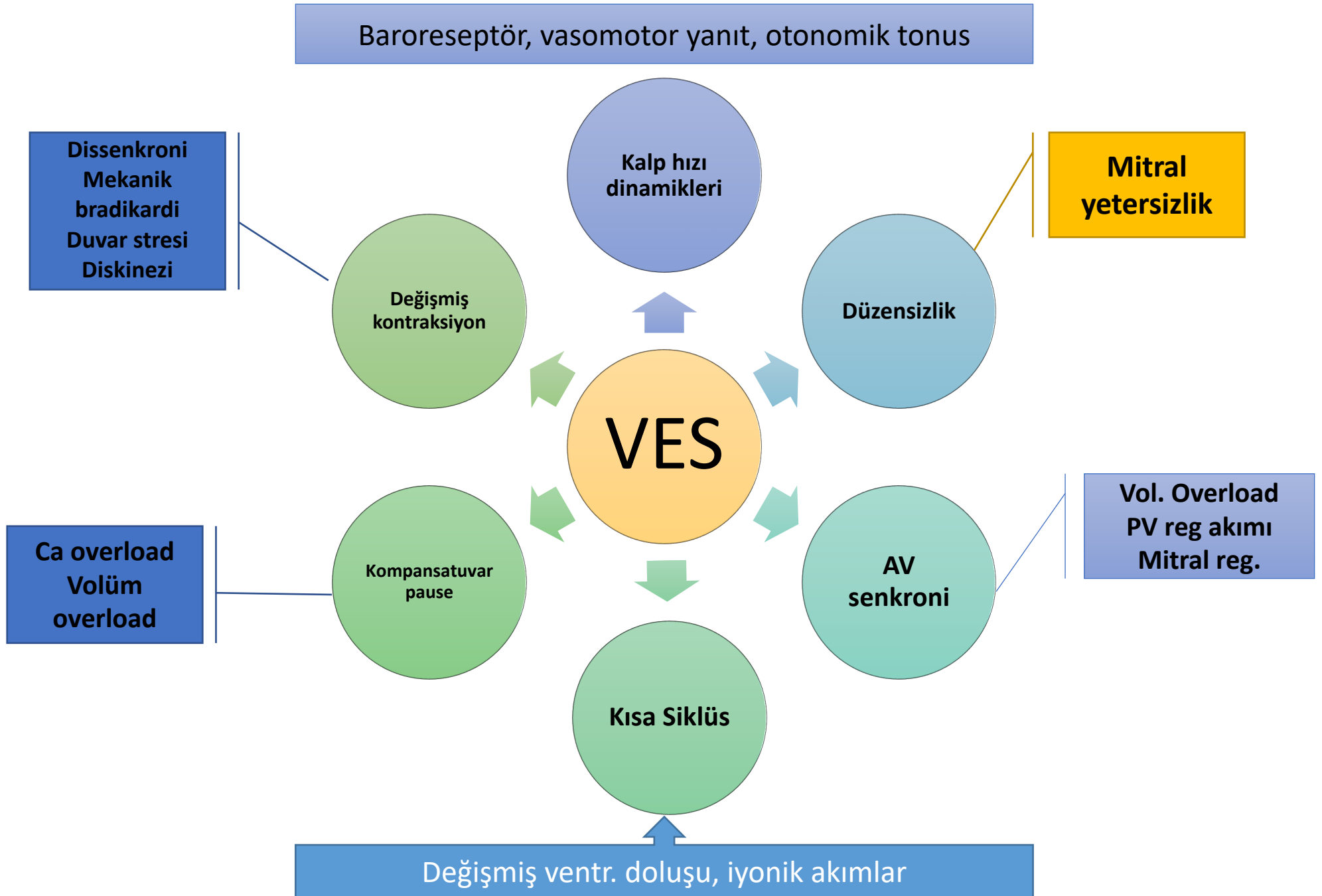
Asemptomatik Yüksek Yoğunluklu VES'ler ve Normal EF

Prof.Dr. Tunay ŐENTÜRK
Bursa Uludağ Üniversitesi Tıp Fakültesi Kardiyoloji AD

- İdiyopatik
- Normal EF
- Semptomlar
- Sık VES



Zeppenfeld K, 2022, ESC Guidelines. European Heart Journal (2022) 43 (40): 3997-4126–130



VES tedavisi için kılavuzlar ne diyor?

- Kılavuzlar semptomatik veya sistolik disfonksiyone neden olan VES için İLAÇ veya ABLASYON öneriyor.

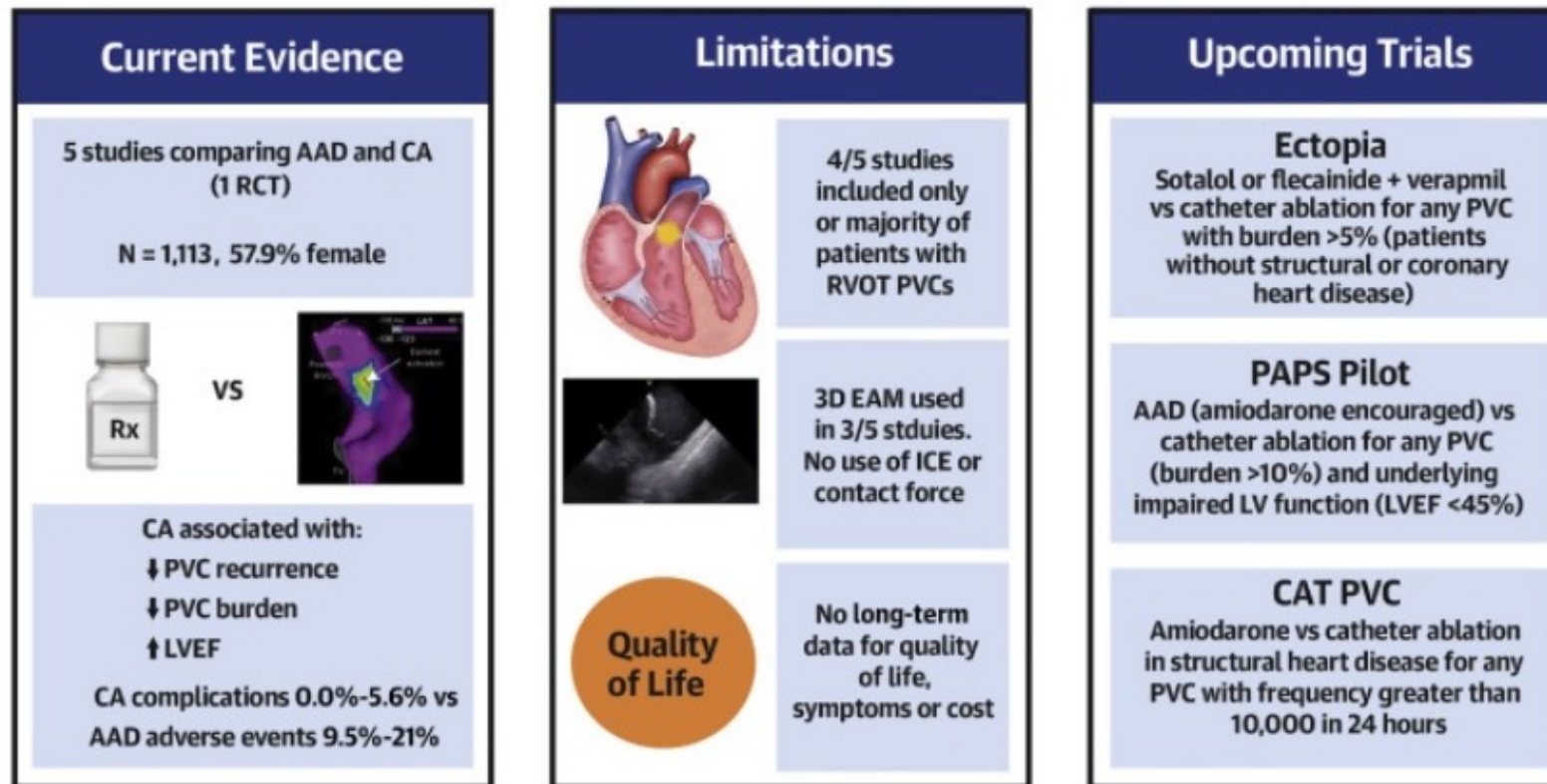


Catheter Ablation vs Antiarrhythmic Drug Therapy for Treatment of Premature Ventricular Complexes: A Systematic Review

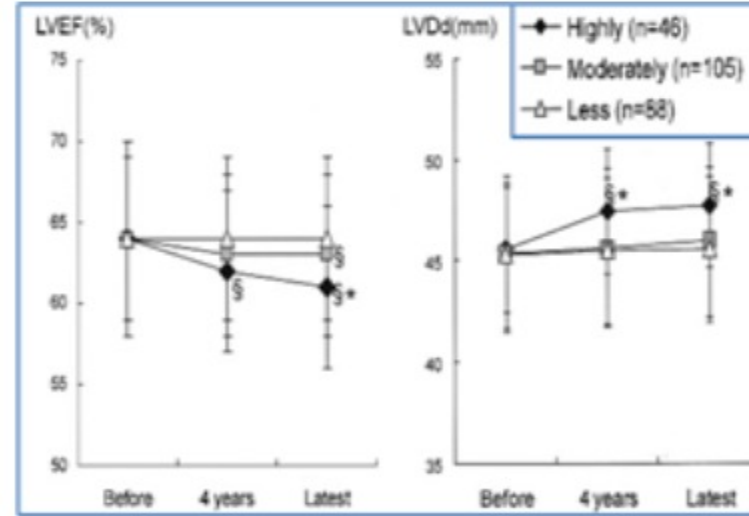
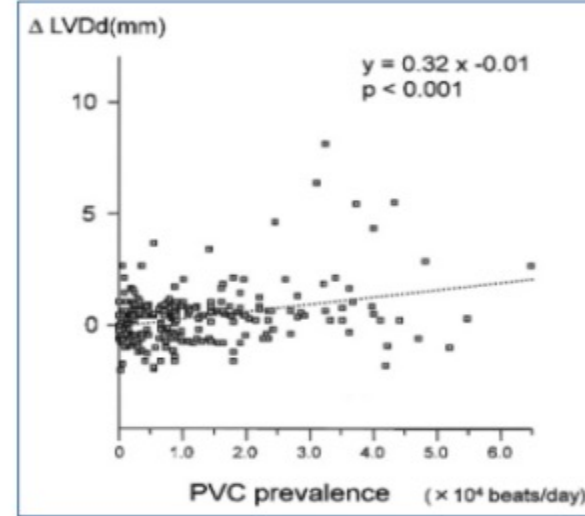
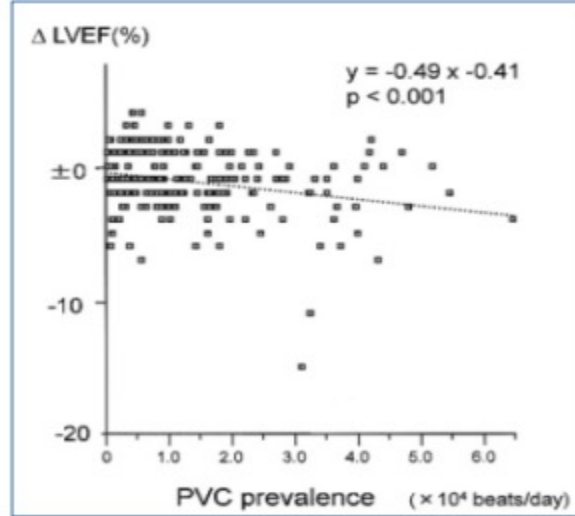
Kasun De Silva ¹, Haris Haqqani ², Rajiv Mahajan ³, Pierre Qian ¹, William Chik ⁴, Aleksandr Voskoboinik ⁵, Peter M Kistler ⁶, Geoffrey Lee ⁷, Nicholas Jackson ⁸, Saurabh Kumar ⁹

Affiliations + expand

PMID: 37380322 DOI: 10.1016/j.jacep.2023.01.035



Prognostic significance of frequent premature ventricular contractions originating from the ventricular outflow tract in patients with normal left ventricular function S Niwano, et al.
Heart 2009;**95**:1230–1237.



- 239 hasta
- Çoğu asemptomatik VES yükü >%1, ventrikül fonksiyonları normal
- Ortalama 5.6 yıl takip
- Yüksek VES yükü (>%20) 46 hasta
- Orta VES yükü (%5-20) 105 hasta
- Düşük VES yükü 88 hasta

- Hastaların %5 inde sol ventrikül disfonksiyonu gelişmiş
- VES yükü fazla olanlarda risk daha fazla
- (VES >10000 - %20, VES < 10000 - %2)
- Advers olay saptanmamış.

Outcomes of untreated frequent premature ventricular complexes with normal left ventricular function

Andrea K Y Lee, Jason Andrade, Nathaniel M Hawkins, George Alexander, Matthew T Bennett, Shanta Chakrabarti, Zachary W Laksman, Andrew Krahn, John A Yeung-Lai-Wah, Marc William Deyell^{1b}

- 2012- 2017
- Asemptomatik veya minimal semptomları olan
- Sol ventrikül EF normal
- Antiaritmik tedavi almayan veya ablasyon uygulanmayan hastalar
- 194 hasta -- Dışlama kriterleri sonrası 100 hasta takip edilmiş.

Table 2 Characteristics of PVCs

| PVC characteristics | All patients (n=100) | Persistent PVCs (n=56) | Spontaneous PVC reduction (n=44) | Univariate HR* |
|--|----------------------|------------------------|----------------------------------|------------------------------|
| Initial PVC burden (%), median (range) | 18.4 (5.4 to 49.8) | 18.8 (5.4 to 49.8) | 17.6 (5.6 to 44.6) | 1.00 (0.97 to 1.03); p=0.860 |
| Initial PVC burden category, N (%) | | | | |
| 5%–9% | 18 (18.0) | 11 (19.6) | 7 (15.9) | Reference |
| 10%–19% | 40 (40.0) | 21 (37.5) | 19 (43.2) | 0.98 (0.41 to 2.33); p=0.958 |
| ≥20% | 42 (42.0) | 24 (42.9) | 18 (40.9) | 0.97 (0.40 to 2.33); p=0.946 |
| Maximum PVC burden (%), median (range) | 20.3 (5.4 to 49.8) | 23.7 (5.4 to 49.8) | 18.7 (5.6 to 44.6) | 0.97 (0.94 to 1.00); p=0.045 |
| PVC QRS duration (ms), mean (SD) | 139.3 (19.2) | 136.9 (19.4) | 142.8 (18.6) | 1.01 (0.99 to 1.03); p=0.230 |
| PVC QRS location, N (%) | | | | |
| RVOT | 34 (34.0) | 22 (39.3) | 12 (27.3) | Reference |
| Non-RVOT RV | 11 (11.0) | 5 (8.9) | 6 (13.6) | 1.40 (0.52 to 3.74); p=0.505 |
| LVOT and AMC | 34 (34.0) | 20 (35.7) | 14 (31.8) | 1.01 (0.47 to 2.20); p=0.967 |
| Non-LVOT LV | 6 (6.0) | 2 (3.6) | 4 (9.1) | 1.63 (0.52 to 5.08); p=0.402 |
| Multiple morphologies | 6 (6.0) | 5 (8.9) | 1 (2.3) | 0.31 (0.04 to 2.39); p=0.261 |
| Not captured | 9 (9.0) | 2 (3.6) | 7 (15.9) | 2.70 (1.05 to 6.90); p=0.037 |

- Hastaların %44 inde ortalama 15.4 ayda VES yükü <%1
- Bu 44 hastada rekürrens %9.1
- Sekonder aritmik sonlanım noktası VES yükünde >%80 azalma -- %52
Ortalama 14.1 ayda
Ancak kalıcı azalma hastaların %11.5'inde devam etmiş
- 4 hasta sol ventrikül disfonksiyonu gelişmiş (53-71 ay)

| Patient | Age, years | Sex | Initial LVEF (%) | Initial PVC burden (%) | Lowest LVEF (%) | Time to LVEF <50% (months) | PVC burden at <LVEF (%) | Recovered with therapy? | Comments |
|---------|------------|-----|------------------|------------------------|-----------------|----------------------------|-------------------------|-------------------------------|--|
| 1 | 46 | M | 60 | 15 | 30 | 63.0 | 49 | Y | <ul style="list-style-type: none"> ▶ Bicuspid aortic valve with mild aortic regurgitation. ▶ Right bundle branch block at baseline ▶ PVC burden increased steadily from 10% to 49%, multiple morphologies. ▶ Developed clinical heart failure. ▶ PVCs treated with amiodarone. ▶ LVEF improved to 56% post amiodarone and heart failure therapy. |
| 2 | 27 | M | 60 | 26 | 48 | 53.8 | 25 | Y | <ul style="list-style-type: none"> ▶ PVC burden ranged from 20.3% to 25.2%. ▶ Developed asymptomatic LV dysfunction. ▶ Underwent successful ablation of RVOT PVC. ▶ LVEF remains 53% 1 year postprocedure. |
| 3 | 22 | M | 61 | 11 | 49 | 56.9 | 12 | N/A (recovered spontaneously) | <ul style="list-style-type: none"> ▶ PVC burden ranged from 3.6% to 13.0%. ▶ Developed asymptomatic LV dysfunction. ▶ Refused PVC therapy. ▶ Repeat LVEF 58% without therapy (PVC burden 11.2% at the time). |
| 4 | 73 | M | 65 | 19 | 43 | 71.3 | 18 | Pending | <ul style="list-style-type: none"> ▶ Variable PVC burden from 2.5% to 19.0%. ▶ Developed asymptomatic LV dysfunction. ▶ Underwent PVC ablation targeting his dominant morphology from the RVOT. ▶ Repeat echocardiography pending. |

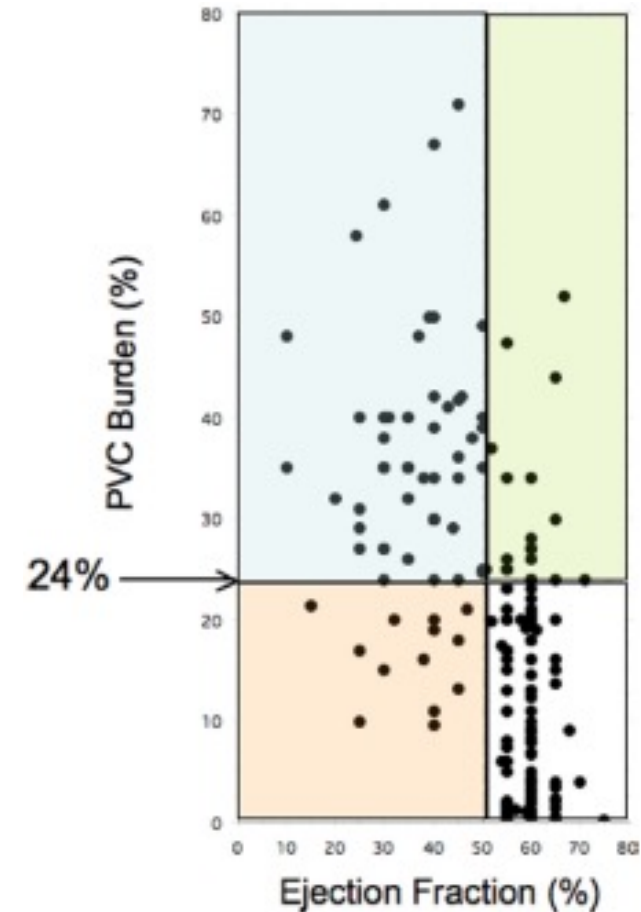
Relationship between burden of premature ventricular complexes and left ventricular function

Table 2 Unadjusted hazard ratios for cardiomyopathy associated with patient and PVC characteristics

| Clinical characteristics | No cardiomyopathy (n = 117) | Cardiomyopathy (n = 57) | HR | 95% CI | P value |
|--|--------------------------------|----------------------------|------|-----------|---------|
| PVC burden prior to ablation, % | 14 ± 12 | 33 ± 14 | 1.12 | 1.07-1.16 | <.01 |
| Pleomorphism | 26 (22) | 13 (23) | 1.17 | 0.54-2.25 | .69 |
| Left bundle branch block | 81 (69) | 32 (56) | 0.62 | 0.32-1.22 | .17 |
| Inferior axis | 94 (80) | 40 (70) | 1.06 | 0.45-2.50 | .90 |
| Nonsustained ventricular tachycardia on Holter monitoring (<1% total PVC burden) | 26 (22) | 16 (28) | 0.79 | 0.34-1.85 | .60 |
| Left-sided PVC | 53 (45) | 28 (49) | 1.29 | 0.66-2.51 | .46 |
| Right ventricular outflow tract | 47 (40) | 18 (32) | 0.63 | 0.32-1.25 | .20 |
| Non-RVOT PVC | 69 (59) | 40 (70) | 1.31 | 0.67-2.54 | .43 |

| PVC burden (%) | Sensitivity (%) | Specificity (%) |
|----------------|-----------------|-----------------|
| 10 | 100 | 46 |
| 16 | 90 | 58 |
| 21 | 80 | 75 |
| 27 | 70 | 88 |
| 30 | 60 | 91 |
| 34 | 50 | 91 |
| 35 | 40 | 94 |
| 39 | 30 | 95 |
| 41 | 20 | 96 |
| 50 | 10 | 99 |

ROC = receiver-operator characteristic; other abbreviations as in Table 2.



Sol ventrikül disfonksiyonu için eşik değer

Table 6 Summary of studies relating PVC burden with LV dysfunction

| | No. of patients with PVCs | No. of patients (asymptomatic) | No. of patients with LV dysfunction (definition) | PVC burden (no LV dysfunction) | PVC burden (LV dysfunction) | PVC burden predictive for LV dysfunction | Lowest PVC burden with LV dysfunction |
|------------------------------------|---------------------------|--------------------------------|--|--------------------------------|-----------------------------|--|---------------------------------------|
| Baman et al. ¹⁶⁴ | 174 | 17 | 57 (LVEF < 50%) | 13 ± 12% | 33 ± 13% | 24% (sensitivity 79%, specificity 78%) | 10% |
| Hasdemir et al. ¹⁶⁵ | 249 | 26 | 17 (LVEF < 50%) | 8.1 ± 7.4 | 29 ± 9.2% | 16% (sensitivity 100%, specificity 87%) | – |
| Munoz et al. ¹⁶⁶ | 70 | – | 17 (LVEF < 50%) | 16.7 ± 13.7 | 29.3 ± 14.6% | 15/17 had PVC burden >10% | 2/17 had PVC burden <10% |
| Ban et al. ¹⁶⁷ | 127 | 7 | 28 (LVEF < 50%) | 22 ± 10% | 31 ± 11% | 26% (sensitivity 70%, specificity 78%) | – |
| Blaye-Felice et al. ¹⁶⁸ | 186 | – | 96 (LVEF < 50%) | 17 ± 12% | 26 ± 12% | – | 10/96 had PVC burden <10% |
| Lie et al. ¹⁶⁹ | 52 | – | 15 (GLS worse than -18%) | 5% | 22% | >8% | – |
| Park et al. ¹⁷⁰ | 180 | 36 | 52 (LVEF <50%) | 28 ± 11.6% | 30.7 ± 10% | 26% (sensitivity 63%, specificity 87%) | – |

LV, left ventricular; LVEF, left ventricular ejection fraction; PVC, premature ventricular contraction.

- Minimum eşik %10
- >% 20 üzeri risk artışı

Arnar DO ve ark . *Europace*. 2019;21(6):844–845

Zeppenfeld K, 2022, ESC Guidelines. *European Heart Journal* (2022) 43 (40): 3997-4126–130

Predictors of adverse outcome in patients with frequent premature ventricular complexes: The ABC-VT risk score ^e

- 2012-2017 arasında, 206 hasta
- 14 gün boyunca Holter: Minimum %7.3, maksimum %17.9

Advers olay: EF >%10 azalma, kalp yetersizliğine bağlı yatış, KV mortalite

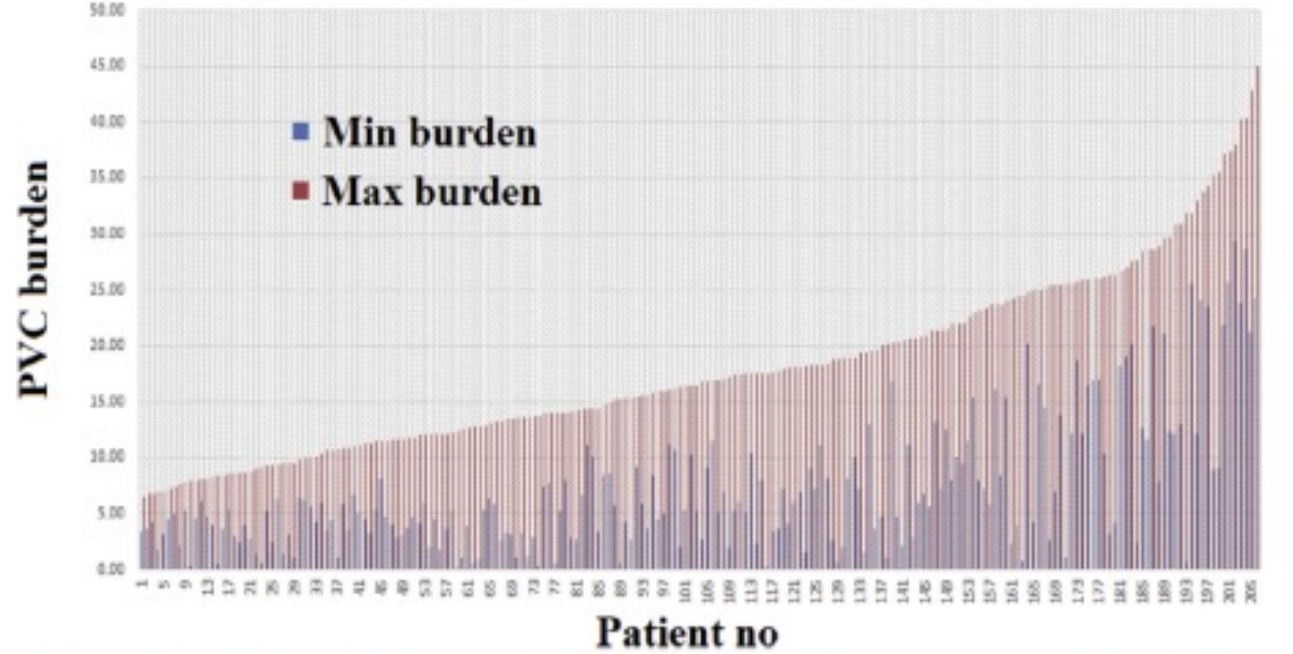


Figure 1 Variability between the lowest 24-hour premature ventricular contraction (PVC) burden (minimum) and the highest 24-hour PVC burden (maximum) throughout the 14-day monitoring period.

Table 1 Baseline characteristics of the derivation cohort (N = 206)

| Parameter | Value |
|--|-------------|
| Clinical | |
| Male sex | 127 (62) |
| Age (y) | 65 ± 16 |
| Body mass index (kg/m ²) | 27 ± 6 |
| Hypertension | 107 (52) |
| Coronary artery disease | 56 (27) |
| Valvular heart disease | 38 (18) |
| Atrial fibrillation | 36 (17) |
| NYHA class | 1.36 ± 0.63 |
| Medications | |
| β-Blockers | 90 (44) |
| Calcium channel blockers | 28 (14) |
| Class I or III antiarrhythmic agents | 7 (3) |
| Echocardiographic | |
| LVEF (%) | 57 ± 12 |
| LVEDVI (mL/m ²) | 63 ± 23 |
| LVESVI (mL/m ²) | 29 ± 19 |
| LAVI (mL/m ²) | 36 ± 16 |
| Electrocardiographic | |
| PVC QRS duration (ms) | 151 ± 19 |
| PVC coupling interval (ms) | 547 ± 85 |
| Post-PVC coupling interval (ms) | 1051 ± 198 |
| Ventricular tachycardia | 122 (59) |
| Ventricular bigeminy | 83 (40) |
| Minimum 24-h PVC burden (%) | 7.3 ± 6.2 |
| Mean 24-h PVC burden (%) | 11.6 ± 6.2 |
| Maximum 24-h PVC burden (%) | 17.9 ± 8.0 |
| Maximum - minimum daily PVC burden (%) | 10.6 ± 5.6 |
| Number of PVC morphologies | 1.9 ± 1.0 |
| Multiple PVC morphologies (%) | 55 |
| LBBB morphology (%) | 60 |
| Inferiorly directed axis (%) | 65 |
| Left ventricular location | 62 |
| Apical location (%) | 13 |

Table 3 Multivariate predictors of adverse LV remodeling (LVEF <45% or LVEDVI >75 mL/m²)

| Parameter | Univariate analysis | | | Multivariate analysis | | |
|-------------------------------|---------------------|-----------|-------|-----------------------|--------------|-------|
| | OR | 95% CI | P | OR | 95% CI | P |
| NSVT | 6.19 | 2.8–15.2 | <.001 | 5.26 | 2.09 – 13.23 | <.001 |
| PVC coupling interval >500 ms | 4.67 | 2.4–9.0 | <.001 | 4.73 | 2.19 – 10.21 | <.001 |
| Superiorly directed PVC axis | 2.27 | 1.4–4.8 | .004 | 2.70 | 1.25 – 5.81 | .01 |
| PVC burden 10%–20%* | 2.20 | 1.1–4.6 | .04 | 3.50 | 1.39 – 8.82 | .01 |
| PVC burden >20%* | 3.47 | 1.2–10.5 | .03 | 4.40 | 1.17 – 16.49 | .03 |
| Broad PVC QRS (>160 ms) | 2.03 | 1.0–4.4 | .07 | – | – | – |
| LBBB morphology PVC | 0.60 | 0.3–1.2 | .12 | – | – | – |
| Right ventricular origin PVC | 1.05 | 0.6–2.0 | .88 | – | – | – |
| Basal origin PVC | 0.53 | 0.2–1.3 | .17 | – | – | – |
| Age | 1.00 | 1.0–1.0 | .98 | – | – | – |
| Male sex | 1.93 | 1.0–3.7 | .05 | – | – | – |
| Atrial fibrillation | 1.93 | 0.9–4.1 | .08 | – | – | – |
| Body mass index | 1.02 | 1.0–1.1 | .56 | – | – | – |
| Hypertension | 1.13 | 0.6–2.1 | .69 | – | – | – |
| Coronary artery disease | 1.48 | 0.8–2.8 | 0.24 | – | – | – |
| >1 PVC morphology | 1.72 | 0.9–3.3 | .10 | – | – | – |
| Ventricular bigeminy | 0.72 | 0.4–1.4 | .30 | – | – | – |
| PVC coupling interval SD | 15.2 | 0.9–258.3 | .06 | – | – | – |

Axis (superior) *1 point*

Minimum Burden

- 10 - 20%* *2 points*
- >20%* *3 points*

Coupling interval (>500ms) *4 points*

Ventricular Tachycardia *4 points*

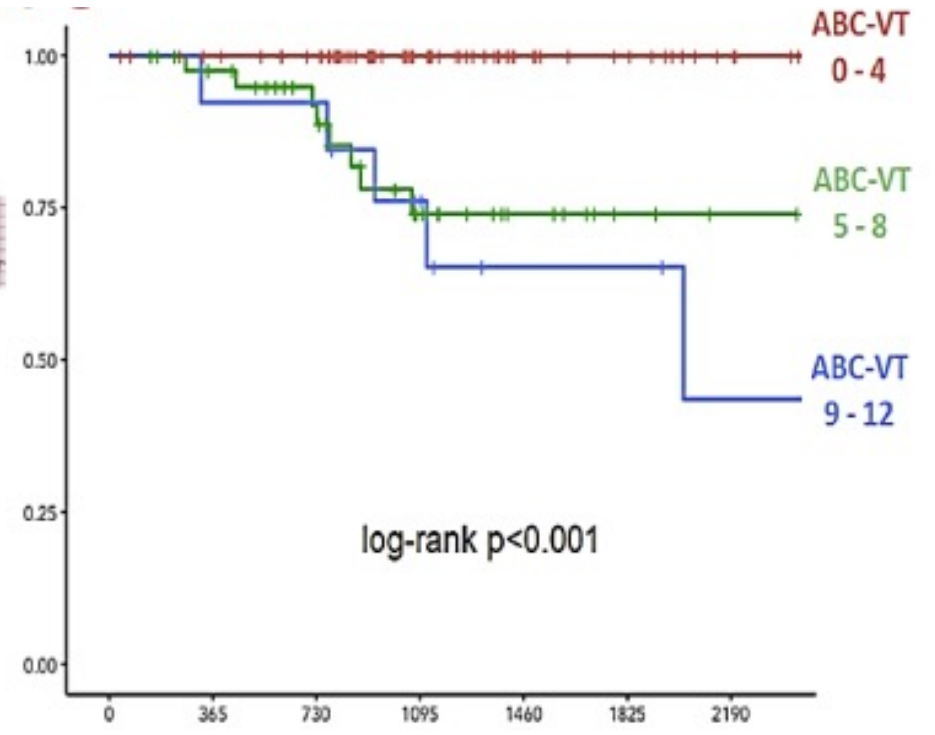
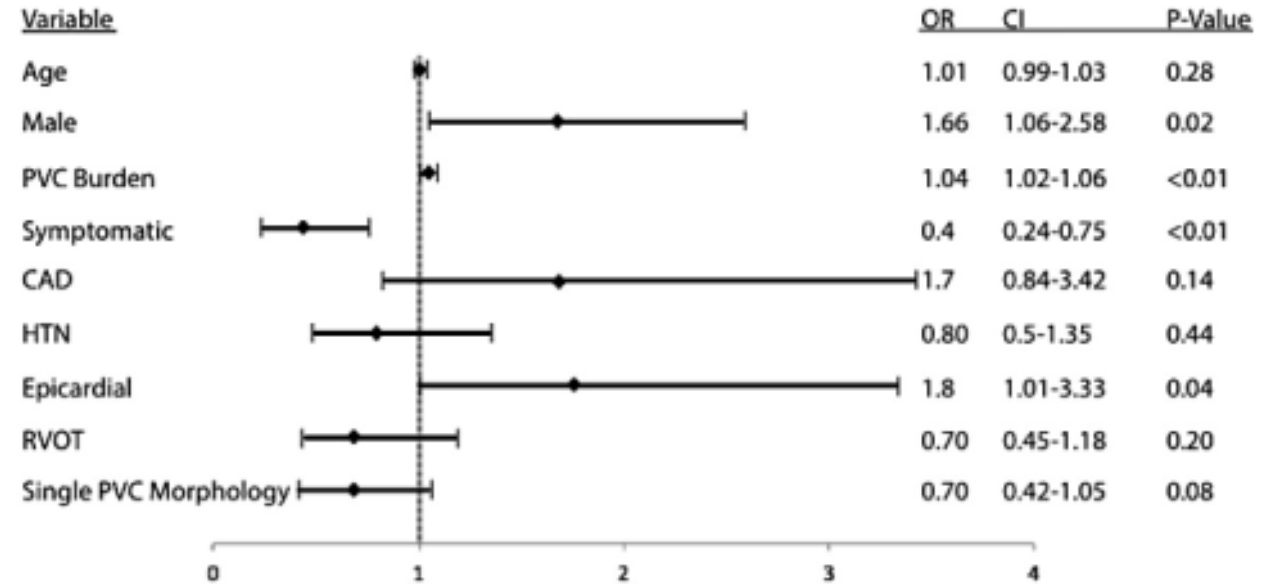


Figure 2 ABC-VT risk score (maximum 12).

Kardiyomiyopati gelişiminin prediktörleri

- Retrospektif
- 1,185 hasta
- EF %55 ± 10
- VES yükü %20 ± 13
- Kardiyomiyopati gelişenler %21
- Akut başarı %84

Multivariate Analysis for Predictors of PVC-Induced Cardiomyopathy



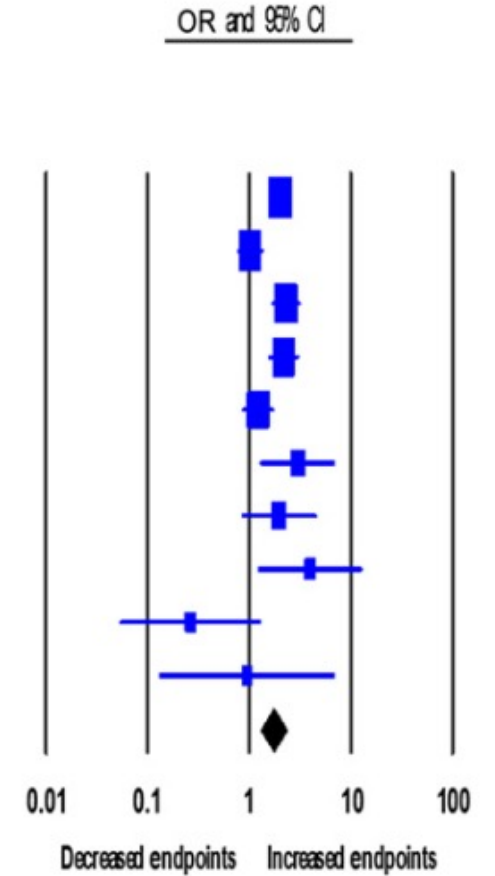
The prognostic significance of premature ventricular complexes in adults without clinically apparent heart disease: a meta-analysis and systematic review

Victor Lee,¹ Harry Hemingway,² Rami Harb,¹ Tom Crake,¹ Pier Lambiase¹

- 10 çalışma
- Yapısal kalp hastalığı olmayan
- 10±4 yıl takip
- Total mortalite/KV mortalite, iskemik kalp hastalığı,
OR 1.72

Table 5 The PVC frequency of each study population

| Name of study | Adjusted No. of PVCs/day |
|---|--|
| Rodstein <i>et al</i> , 1971 ⁶ | 35% >14 400 PVC/day; 65% <14 400 PVC/day |
| Desai <i>et al</i> , 1973 ⁷ | 95% <23 040/day |
| Rabkin <i>et al</i> , 1981 ¹⁶ | No information |
| Kennedy <i>et al</i> , 1985 ¹² | Mean 13 584/day; 26% NSVT |
| Abdalla <i>et al</i> , 1987 ¹⁷ | 62% has >1400 PVC/day or complex |
| Bikkina <i>et al</i> , 1992 ¹⁹ | 100% >720 PVC/day or complex |
| Hirose <i>et al</i> , 2010 ²¹ | No information |
| Cheriyath <i>et al</i> , 2011 ²² | No information |



Beneficial effects of catheter ablation on left ventricular and right ventricular function in patients with frequent premature ventricular contractions and preserved ejection fraction

Adrianus P Wijnmaalen, Victoria Delgado, Martin J Schaliij, Carine F B van Huls van Taxis, Eduard R Holman, Jeroen J Bax, Katja Zeppenfeld

- 49 hasta
- VES yükü $\%26 \pm 13$
- Normal Sol ventrikül hacmi ve EF



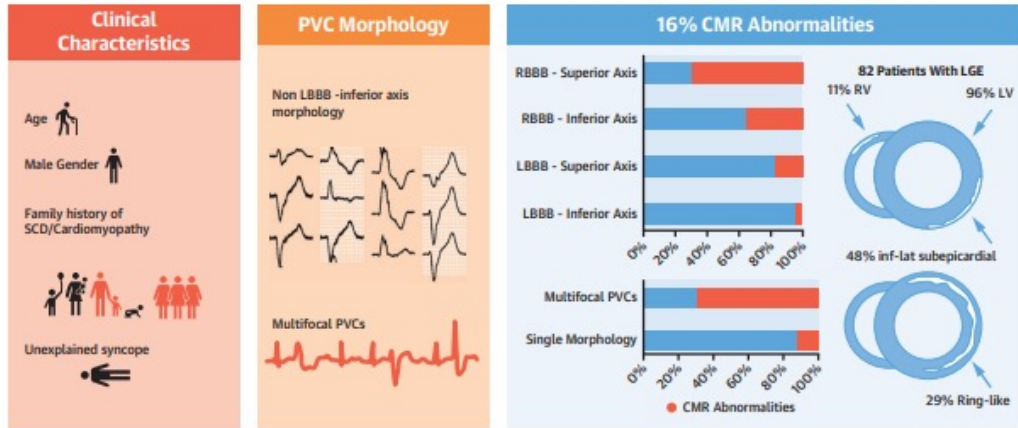
Speckle tracking görüntüleme azalmış sağ ve sol ventrikül straini

Risk Stratification of Patients With Apparently Idiopathic Premature Ventricular Contractions

A Multicenter International CMR Registry

Apparently Idiopathic PVCs Risk Stratification

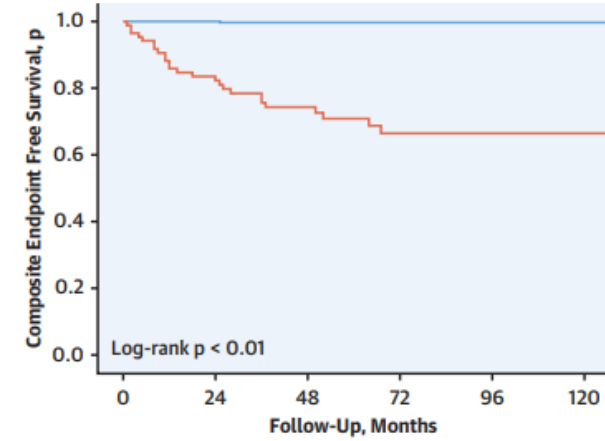
518 subjects, frequent PVCs (>1,000/24h)
 Normal ECG and normal Echo



Prognosis: SCD/Resuscitated Cardiac Arrest/ICD-Shocks

TABLE 3 Arrhythmia Features

| | |
|--|------------|
| PVCs burden, % of total beat count on 24 h | 16 (10-20) |
| Multifocal PVCs | 39 (8) |
| 12-lead ECG morphology of the dominant PVC | |
| LBBB: inferior axis | 364 (70) |
| LBBB: superior axis | 28 (5) |
| RBBB: inferior axis | 70 (14) |
| RBBB: superior axis | 56 (11) |

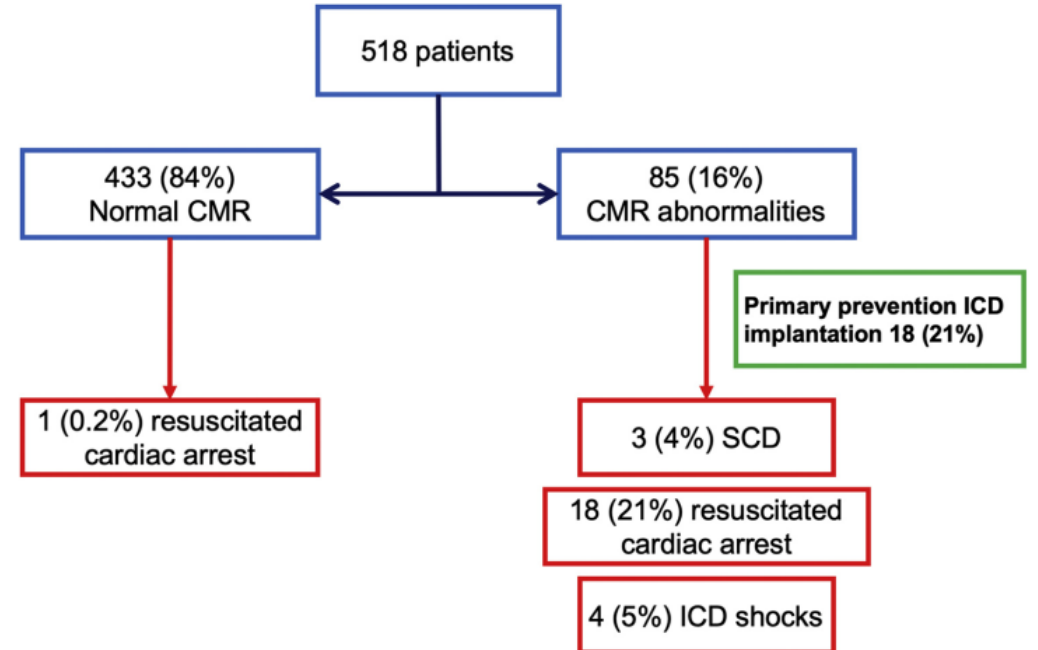


Number at risk

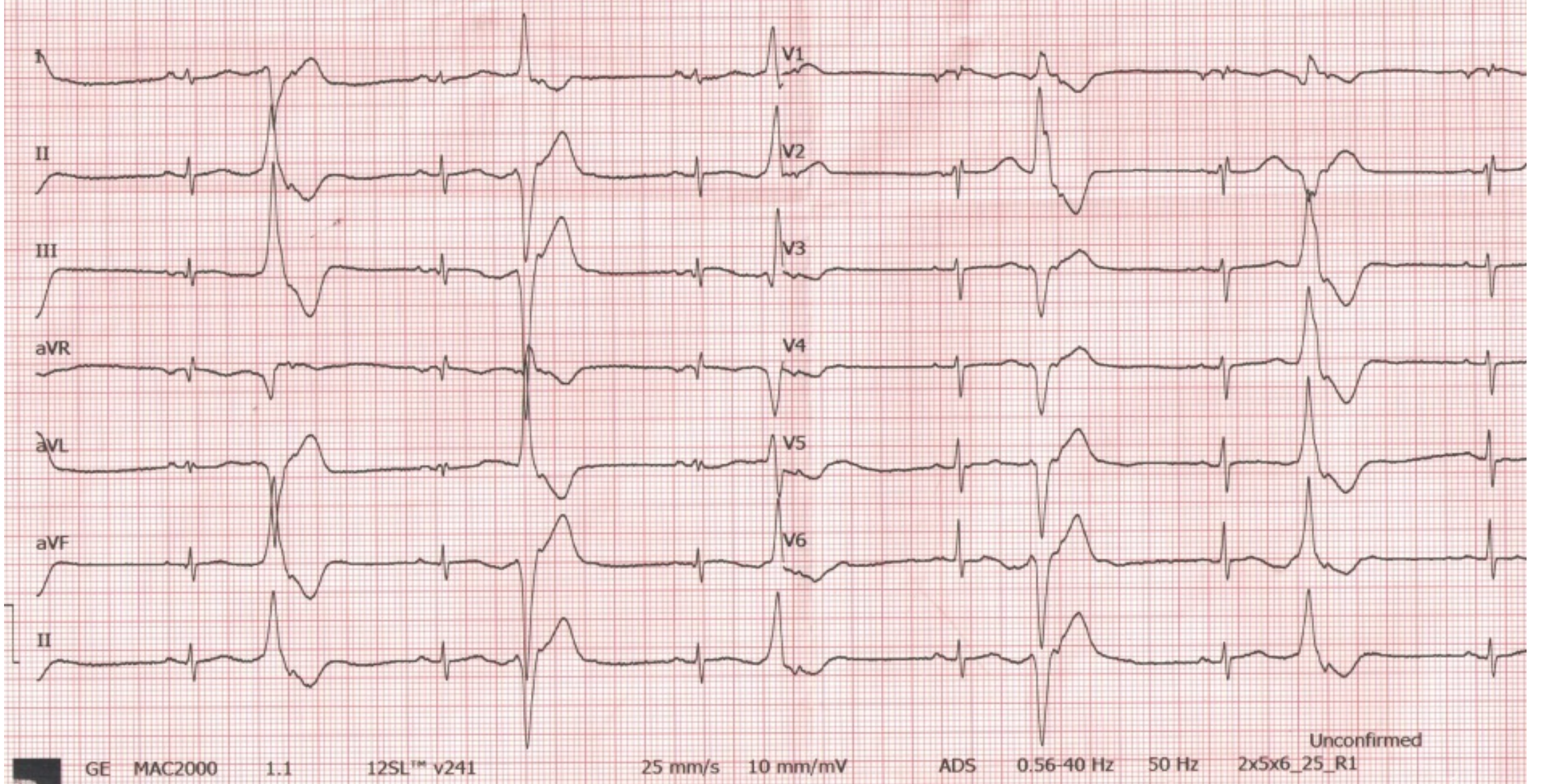
| Follow-Up, Months | 0 | 24 | 48 | 72 | 96 | 120 |
|-------------------|-----|-----|-----|-----|----|-----|
| ● 433 | 432 | 323 | 197 | 115 | 56 | |
| ● 85 | 70 | 44 | 25 | 10 | 7 | |

CMR Structural Abnormalities

- Absent
- Present

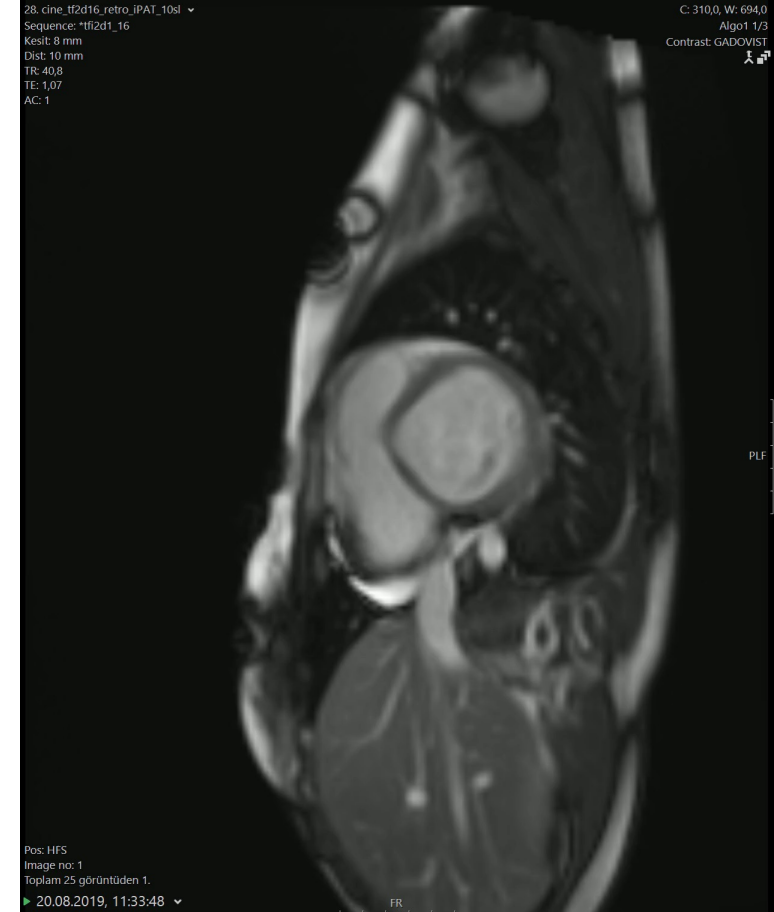
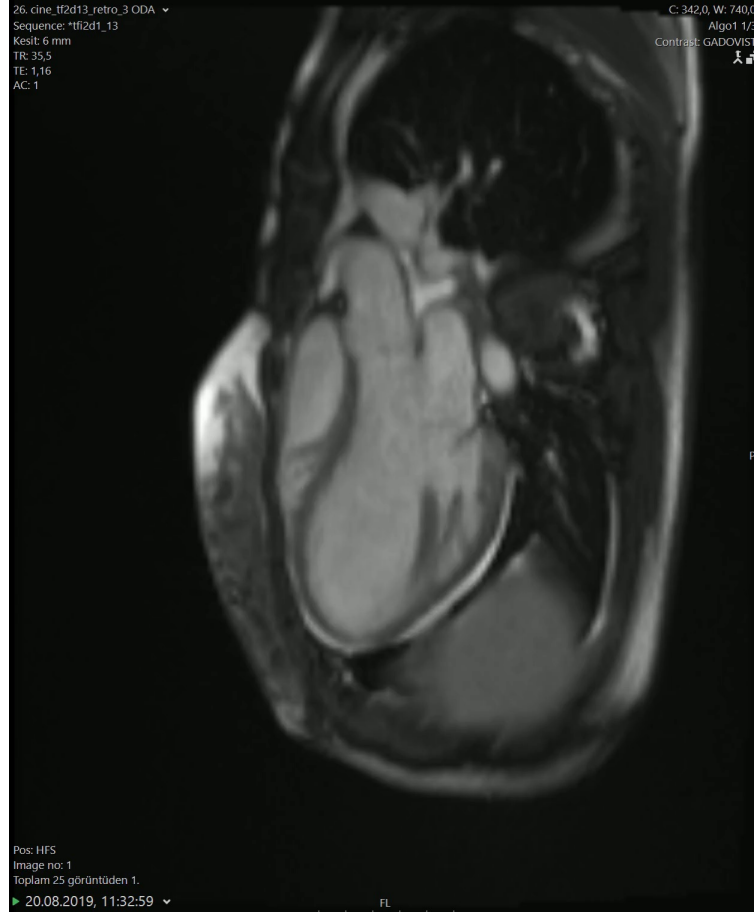


- 19 yaş, bayan hasta, Yapısal kalp hastalığı yok
- Holterde 12000/24 saat VES, Ekokardiyografi normal





Kardiyak MR Görüntüleme







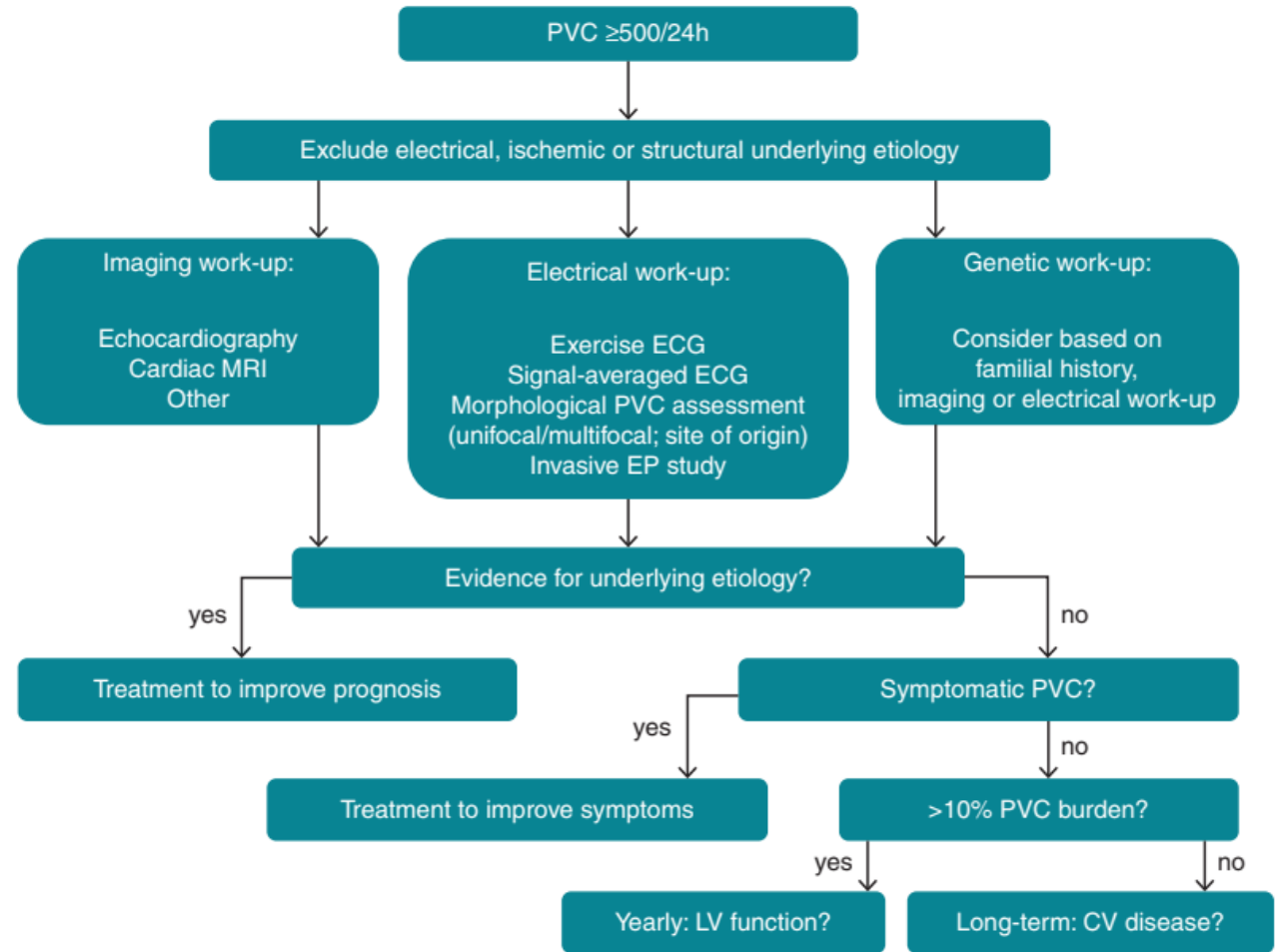
1.SCN5A geninde c.6013C>G (p.Pro2005Ala) Heterozigot varyant (NM_000335.4) (VF %39)

Kötü prognoz ile ilişkili VES'ler

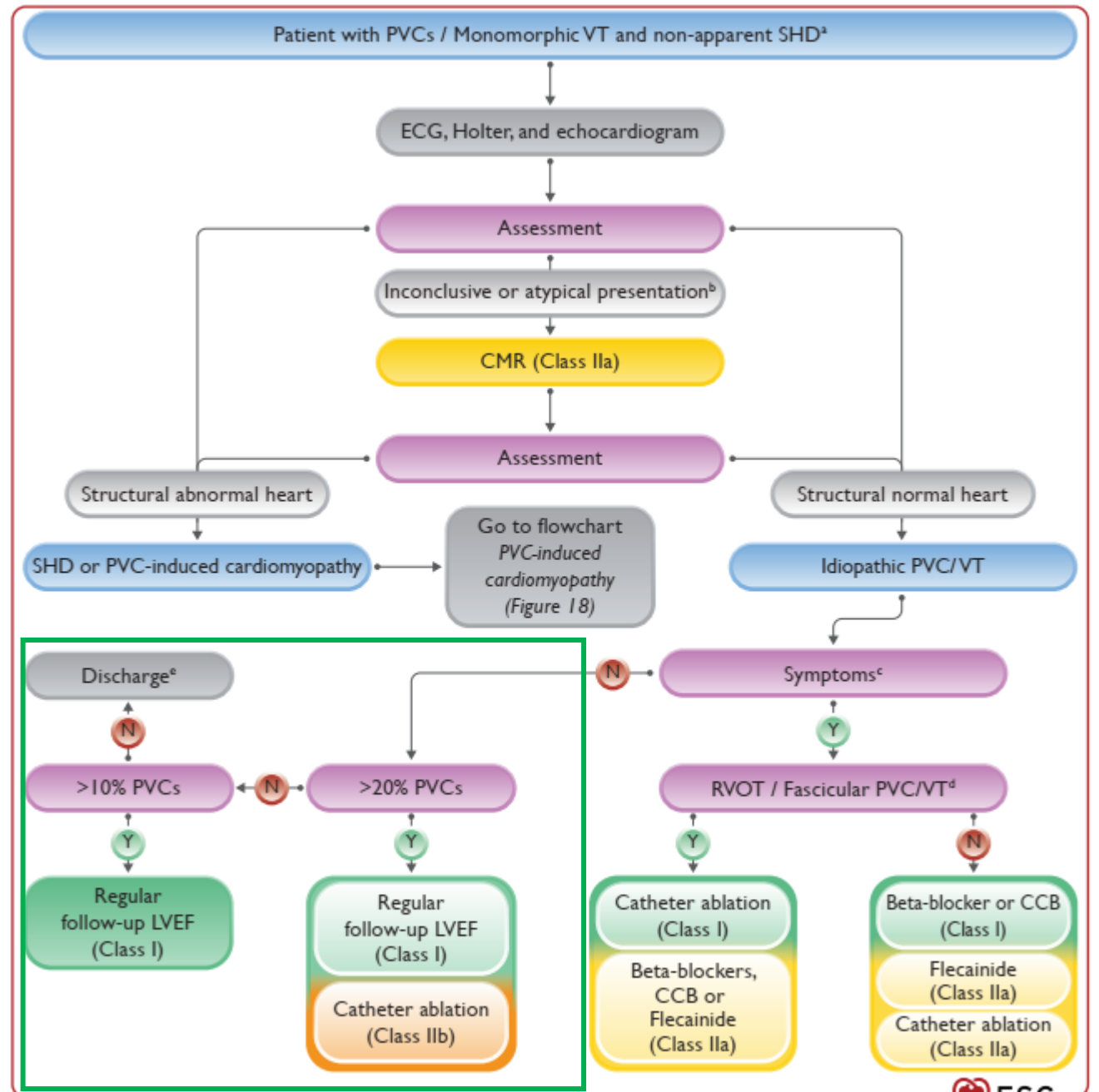
- Altta yatan yapısal, iskemik veya elektriksel hastalık
- >2000 /gün
- Kompleks VES (couplet, tripler ve nonsustained VT)
- Multipl
- Egzersizle artması
- Çıkış yolu dışından kaynaklananlar
- Kısa eşlenme aralığı (R on T)
- Geniş QRS

Asemptomatik VES'lerde ne yapalım?

| Consensus statements | Symbol | References |
|---|---|------------------|
| Asymptomatic patients with frequent PVCs (>500 per 24 h) should be referred to a specialist for further evaluation to rule out any underlying structural, ischaemic, or electrical heart disease. |  | 151,152 |
| Very frequent PVCs (burden > 20%) are a marker of all-cause and cardiovascular mortality and may justify intensified follow-up. |  | 154 |
| PVCs should be treated in patients with suspected PVC-mediated cardiomyopathy. |  | Expert consensus |
| Treatment of patients with asymptomatic PVCs should focus on the underlying heart disease in order to improve prognosis. |  | Expert consensus |



Asemptomatik
VES'lerde kılavuzlar
ne diyor?



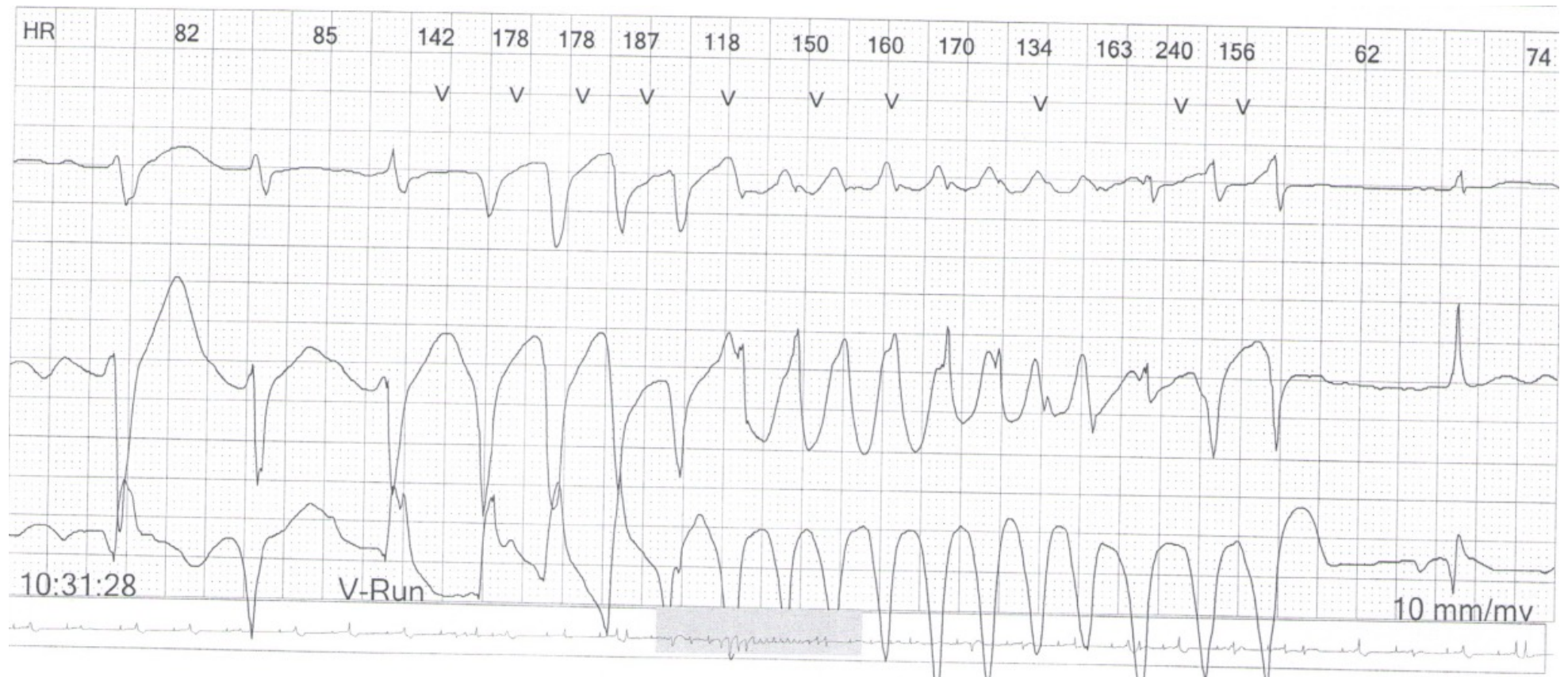
| | RVOT-Fasiküler | | RVOT/Fasiküler DIŐI | | VES Yüğü >%20 Asemptomatik Normal LV |
|--------------------|----------------|---|---------------------|-----------|--|
| | Normal LV | LV Disfonksiyonu | LV Disfonksiyonu | Normal LV | |
| Ablasyon | Sınıf I | Sınıf I | Sınıf I | IIa | IIb |
| Beta bloker | IIa | <p>535. Latchamsetty R, Yokokawa M, Morady F, Kim HM, Mathew S, Tilz R, et al. Multicenter outcomes for catheter ablation of idiopathic premature ventricular complexes. <i>JACC Clin Electrophysiol</i> 2015;1:116–123.</p> <p>600. Baman TS, Lange DC, Ilg KJ, Gupta SK, Liu T-Y, Alguire C, et al. Relationship between burden of premature ventricular complexes and left ventricular function. <i>Heart Rhythm</i> 2010;7:865–869.</p> <p>601. van Huls van Taxis CFB, Piers SRD, de Riva Silva M, Dekkers OM, Pijnappels DA, Schalij MJ, et al. Fatigue as presenting symptom and a high burden of premature ventricular contractions are independently associated with increased ventricular wall stress in patients with normal left ventricular function. <i>Circ Arrhythm Electrophysiol</i> 2015;8:1452–1459.</p> | | | |
| KKB | IIa | | | | |
| Flekainid | IIa | | | | |
| Amiodaron | Sınıf III | | | | |

2019 HRS/EHRA/APHRS/LAHRS expert consensus statement on catheter ablation of ventricular arrhythmias

successful ablation, the majority of patients with PVC-induced cardiomyopathy experience significant improvement and, possibly, normalization of their LVEF. Based on a review of current data, routine catheter ablation of frequent PVCs in asymptomatic patients without evidence of LV dysfunction is not presently recommended. In some asymptomatic patients with very frequent PVCs and preserved cardiac function who express a strong preference for ablation, approximately half of the writing committee members agreed that an ablation can be considered after adequate counseling on the risks, benefits, and alternatives to ablation, whereas half would not offer ablation. Additional clinical features that may portend worsening LV function that should be considered include LV dilation or a relative decrease in EF that may still be considered in the normal range.

- Asemptomatik ?
- Sol ventrikül fonksiyonları
- Takip edilen hastaların anksiyetesi, yaşam kalitesi, maliyet, etkinlik

TEŞEKKÜRLER



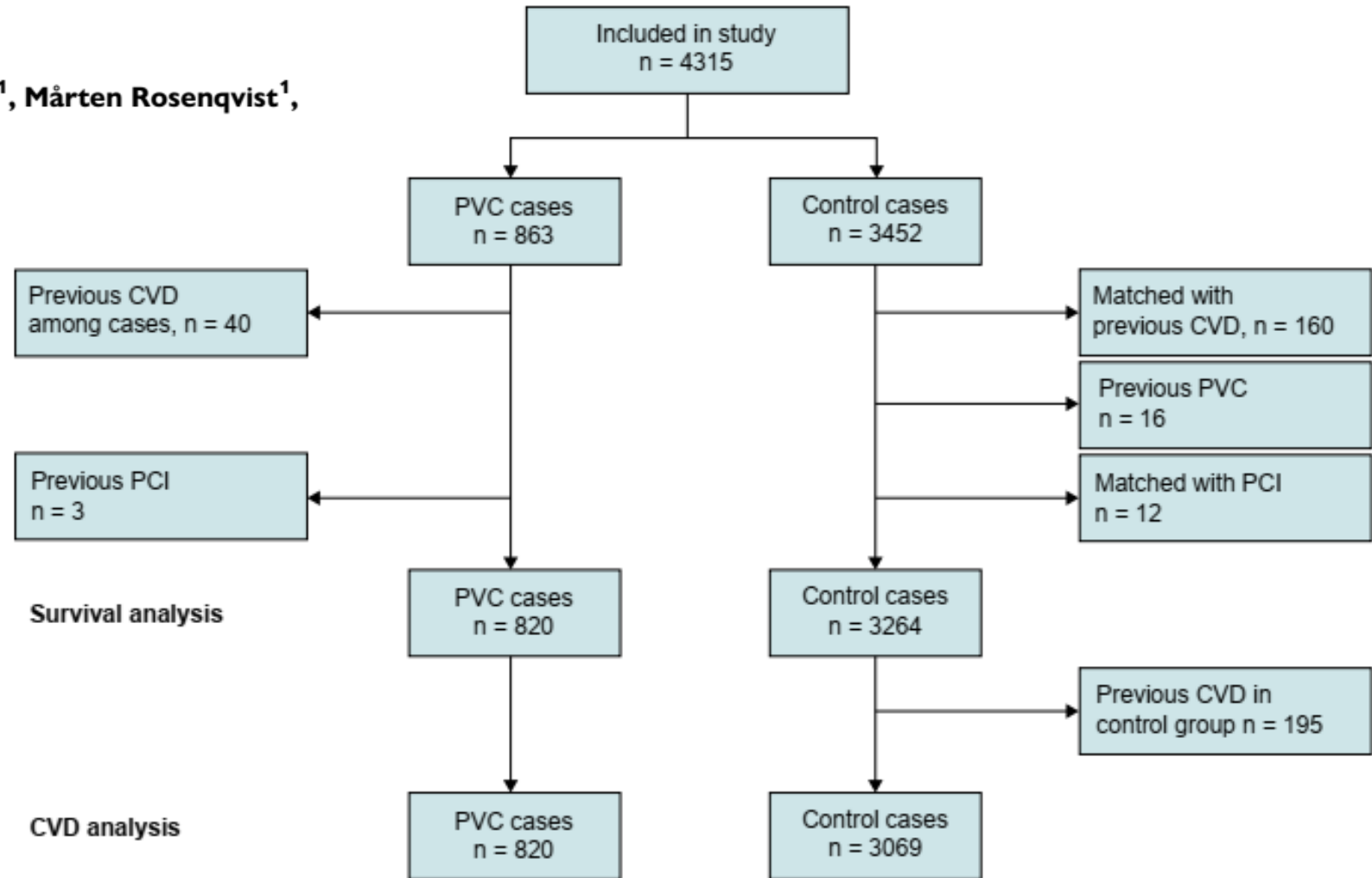
Prognostic implication of premature ventricular contractions in patients without structural heart disease

Raffaele Scorza ^{1*}, Martin Jonsson ², Leif Friberg ¹, Mårten Rosenqvist ¹, and Viveka Frykman ¹

Prospektif çalışma
2010-2016 hasta alımı

EKG kayıtları 24 saat holter
telemetri
EF >%55 normal

Takip 31/12/2018



Sonuçlar

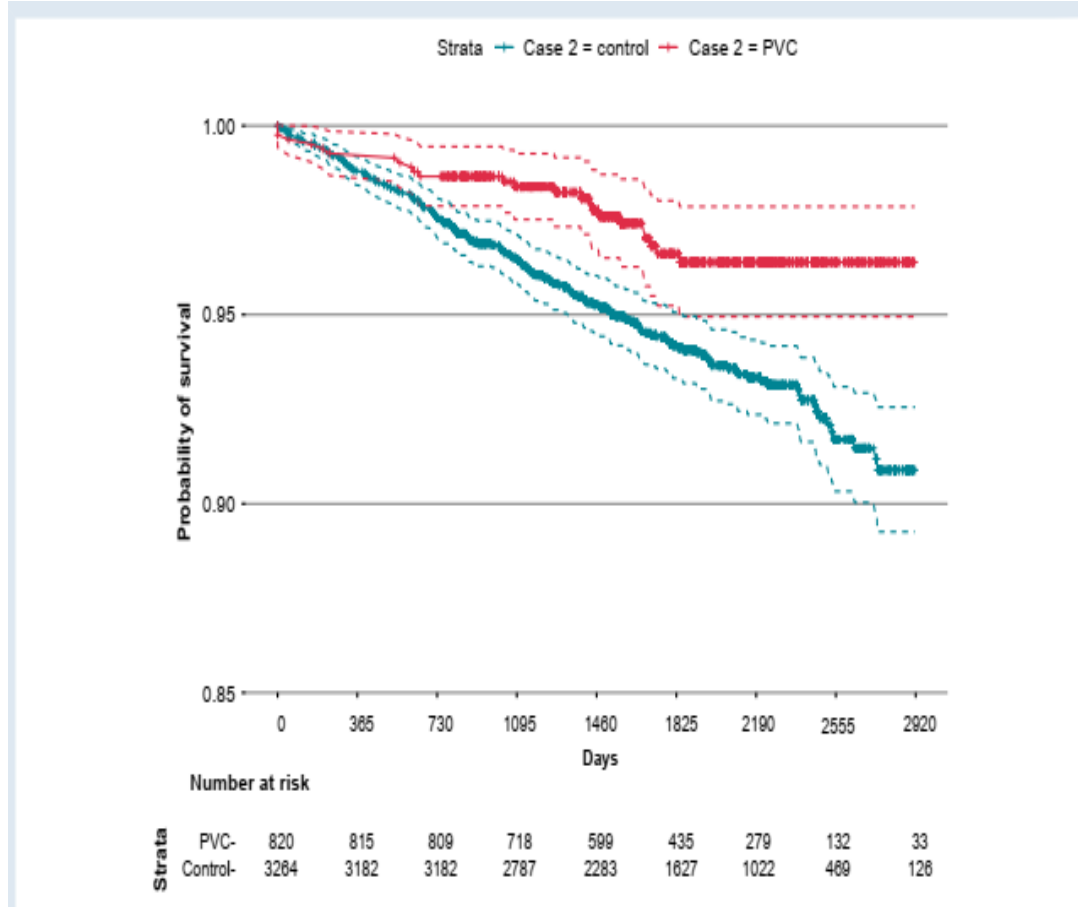


Figure 2 Kaplan-Meier plot for survival probability in PVC and control groups.

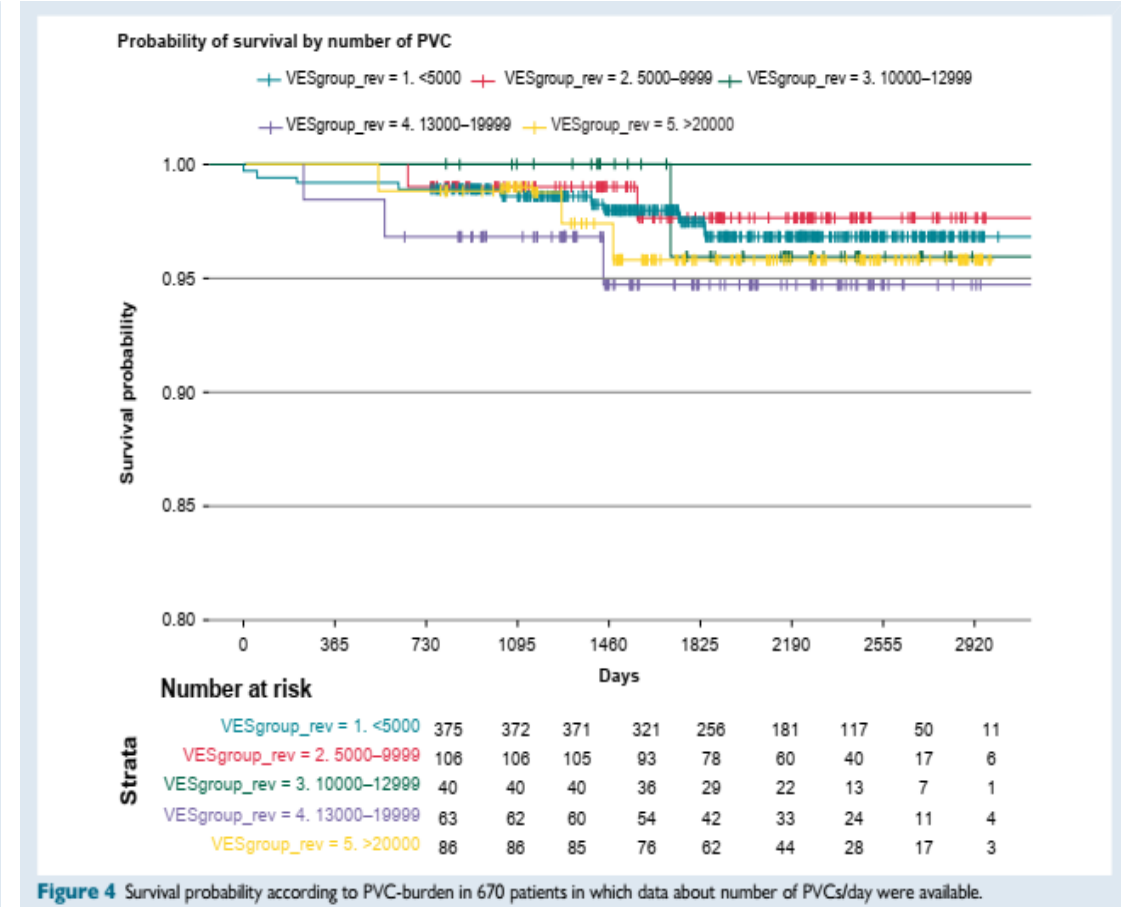
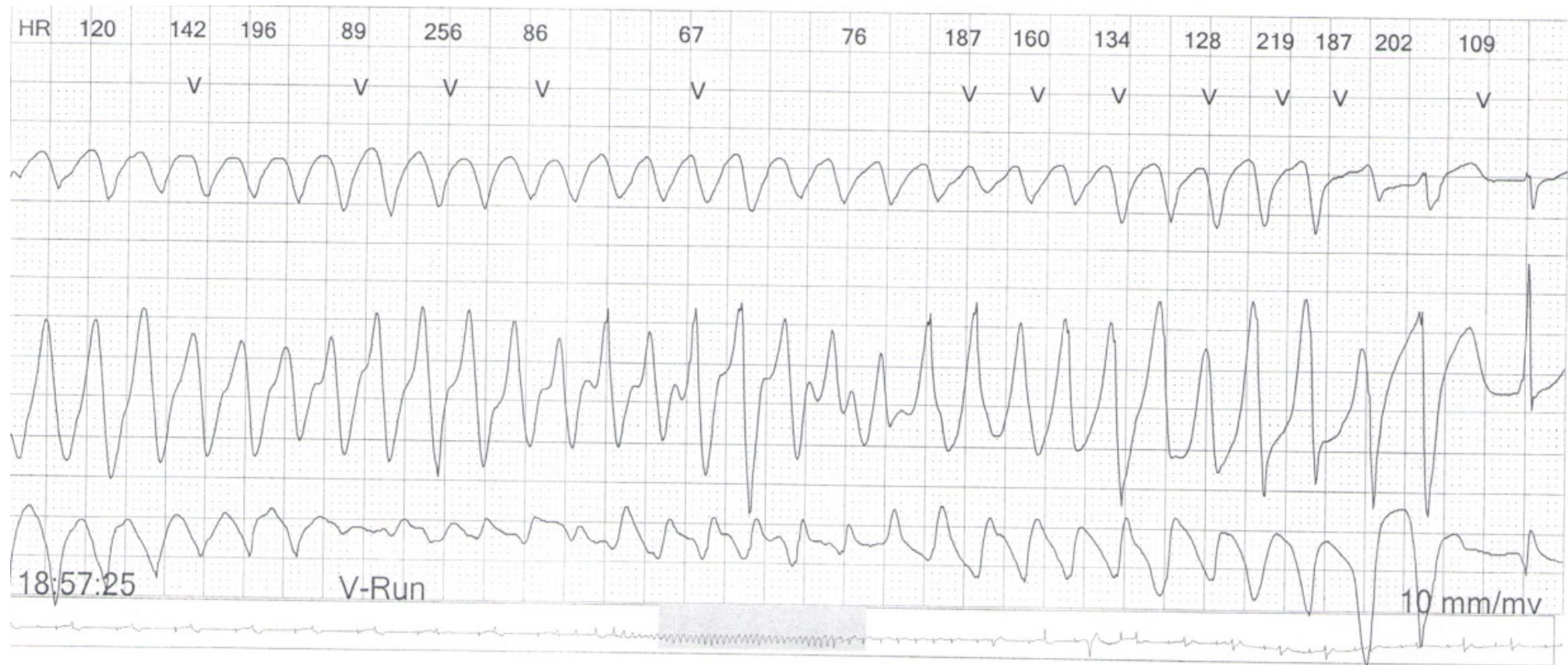


Figure 4 Survival probability according to PVC-burden in 670 patients in which data about number of PVCs/day were available.

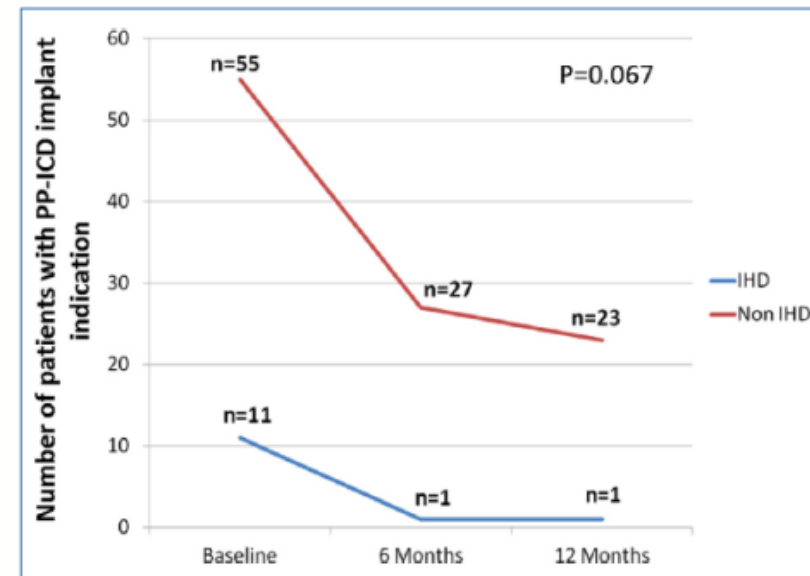


PVC ablation for avoiding « primary » ICD

ICD avoided in 2/3 of cases most at 6 months (w ou wo associated CM)
no successfully ablated patients with burden > 13% had this indication at 6 months

no malignant VA or SD at 6 months FU thereafter

Penala D, et al. Heart Rhythm 2015;12:2434–2442



Hastaların özellikleri

| | PVC cohort (N = 820) | Controls (N = 3069) | P | SMD |
|---|-----------------------------|----------------------------|----------|------------|
| Age, median (IQR) | 59.0 (45.0–70.0) | 59.0 (45.0–69.0) | 0.590 | 0.018 |
| Men, n (%) | 347 (42.3) | 1249 (40.7) | 0.425 | 0.033 |
| Ischaemic heart disease, n (%) | 0 (0.0) | 0 (0.0) | NA | <0.001 |
| Heart Failure, n (%) | 0 (0.0) | 0 (0.0) | NA | <0.001 |
| Cancer, n (%) | 112 (13.7) | 265 (8.6) | <0.001 | 0.160 |
| Hypertension, n (%) | 173 (21.1) | 398 (13.0) | <0.001 | 0.218 |
| Diabetes, n (%) | 39 (4.8) | 161 (5.2) | 0.635 | 0.022 |
| Cerebrovascular disease, n (%) | 23 (2.8) | 92 (3.0) | 0.862 | 0.011 |
| Hyperlipidaemia, n (%) | 66 (8.0) | 96 (3.1) | <0.001 | 0.215 |
| Atrial Fibrillation, n (%) | 50 (6.1) | 87 (2.8) | <0.001 | 0.158 |
| Beta Blockers, n (%) | 410 (50.0) | 585 (19.1) | <0.001 | 0.688 |
| Anticoagulants and platelet-inhibitors, n (%) | 238 (29.0) | 570 (18.6) | <0.001 | 0.247 |
| Antiarrhythmic drug, class 1, n (%) | 14 (1.7) | 8 (0.3) | <0.001 | 0.147 |
| Antiarrhythmic drug, class 3, n (%) | 11 (1.3) | 1 (0.0) | <0.001 | 0.159 |
| Calcium channel blockers, n (%) | 216 (26.3) | 520 (16.9) | <0.001 | 0.230 |
| Diuretics, n (%) | 311 (37.9) | 865 (28.2) | <0.001 | 0.208 |
| Digitalis, n (%) | 6 (0.7) | 8 (0.3) | 0.094 | 0.067 |
| ACE inhibitors, n (%) | 159 (19.4) | 472 (15.4) | 0.007 | 0.106 |
| Angiotensin receptor blockers, n (%) | 108 (13.2) | 335 (10.9) | 0.081 | 0.069 |

Table 9 Summary of the recommendations for the treatment of patients with frequent idiopathic premature ventricular complexes/ventricular tachycardia or premature ventricular complex-induced cardiomyopathy

| | Ablation | Beta-blocker | CCB | Flecainide | Amiodarone |
|---|-----------|--------------|------------------------|------------------------|------------|
| RVOT/fascicular PVC/VT: Symptomatic, normal LV function | Class I | Class IIa | Class IIa | Class IIa | Class III |
| PVC/VT other than RVOT/fascicular: Symptomatic, normal LV function | Class IIa | Class I | Class I | Class IIa | Class III |
| RVOT/fascicular PVC/VT: LV dysfunction | Class I | Class IIa | Class III ^a | Class IIa ^b | Class IIa |
| PVC/VT other than RVOT/fascicular: LV dysfunction | Class I | Class IIa | Class III ^a | Class IIa ^b | Class IIa |
| PVC: Burden >20%, asymptomatic, normal LV function | Class IIb | | | | Class III |