

# **Kalp Yetersizlikli Hastalarda Atriyal Fibrilasyon Ablasyonunun Etkinliđi**

Doç. Dr. Fırat Özcan

Türkiye Yüksek İhtisas Eğitim ve Araştırma Hastanesi

Kardiyoloji Kliniđi Aritmi

KY AF



Hafif KY AF p

Caldwell JC, Mamas MA. Heart failure, diastolic dysfunction and atrial fibrillation; mechanistic insight of a complex inter-relationship. *Heart Fail Rev* 2012; 17: 27-33 [PMID: 22100000 DOI: 10.1007/s10044-010-9204-4]

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[pmjmed.2009.06.033]

PT. Atrial fibrillation in con-  
*Clin* 2010; 6: 187-200 [PMID:  
19.11.001]

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son L.W.: Atrial fibrillation is  
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03

Wang T.J., Larson M.G., Levy D., et al: Temporal relations of atrial fibrillation and congestive heart failure and their joint influence on mortality: the Framingham Heart Study. *Circulation* 2003; 107: pp. 2920-2925

# AF KY kötüleştirir ve mortaliteyi artırır

Olsson LG, Swedberg K, Ducharme A, Granger CB, Michelsson EL, McMurray JJ, Puu M, Yusuf S, Pfeffer MA. Atrial fibrillation and risk of clinical events in chronic heart failure with and without left ventricular systolic dysfunction: results from the Candesartan in Heart failure-Assessment of Reduction in Mortality and morbidity (CHARM) program. *J Am Coll Cardiol* 2006; **47**: 1907-1914 [PMID: 16697316 DOI: 10.1016/j.jacc.2006.01.060]

Mamas MA, Caldwell JC, MJ, Ambrosy AP, Vaduganathan M, O'Connor CM, Swedberg K, Zannad F, Konstam MA, Maggioni AP. Atrial fibrillation or flutter on initial electrocardiogram is associated with worse outcomes in patients admitted for worsening heart failure with reduced ejection fraction: findings from the EVEREST Trial. *Am Heart J* 2012; **164**: 884-92.e2 [PMID: 23194489 DOI: 10.1016/j.ahj.2012.09.011]

Ahmed A, Thornton P, Peck JF. Impact of atrial fibrillation in older adults hospitalized for heart failure. *Heart Fail* 2004; **6**: 421-426 [PMID: 15500000 DOI: 10.1016/j.ejheart.2003.11.011]

Caldwell JC, Contractor H, Petkar S, Ali R, Clarke B, Garratt CJ, Neyses L, Mamas MA. Atrial fibrillation is under-recognized in chronic heart failure: insights from a heart failure cohort treated with cardiac resynchronization therapy. *Europace* 2009; **11**: 1295-1300 [PMID: 19648586 DOI: 10.1093/europace/eup201]

## ve hastane içi mortaliteyi artırır

Maisel W.H., and Stevenson L.W.: Atrial fibrillation in heart failure: epidemiology, pathophysiology, and rationale for therapy. *Am J Cardiol* 2003; **91**: pp. 2D-8D

Mentz RJ, Chung MJ, Gheorghiade M, Pang PS, Kwasny Onnor CM, Swedberg K, Zannad F, Konstam MA, Maggioni AP. Atrial fibrillation or flutter on initial electrocardiogram is associated with worse outcomes in patients admitted for worsening heart failure with reduced ejection fraction: findings from the EVEREST Trial. *Am Heart J* 2012; **164**: 884-92.e2 [PMID: 23194489 DOI: 10.1016/j.ahj.2012.09.011]

increased risk for mortality and heart failure progression in patients with asymptomatic and symptomatic left ventricular systolic dysfunction: a retrospective analysis of the SOLVD trials. *Studies of Left Ventricular Dysfunction. J Am Coll Cardiol* 1998; **32**: 695-703 [PMID: 9741514 DOI: 10.1016/S0735-1097(98)00297-6]

Pang PS, Kwasny Onnor CM, Swedberg K, Zannad F, Konstam MA, Maggioni AP. Atrial fibrillation is associated with worse outcomes in patients admitted for worsening heart failure with reduced ejection fraction: findings from the EVEREST Trial. *Am Heart J* 2012; **164**: 884-92.e2 [PMID: 23194489 DOI: 10.1016/j.ahj.2012.09.011]

ki MJ, Waclawiw J. Atrial fibrillation is associated with an increased risk for mortality and heart failure progression in patients with asymptomatic and symptomatic left ventricular systolic dysfunction: a retrospective analysis of the SOLVD trials. *Studies of Left Ventricular Dysfunction. J Am Coll Cardiol* 1998; **32**: 695-703 [PMID: 9741514 DOI: 10.1016/S0735-1097(98)00297-6]



**Table 1 Prognostic impact of atrial fibrillation in heart failure**

| Ref.                                      | Setting                    | n     | LVEF              | Mean follow up (yr) | AF  | Deaths n (%) |            | P-value  |
|-------------------------------------------|----------------------------|-------|-------------------|---------------------|-----|--------------|------------|----------|
|                                           |                            |       |                   |                     |     | SR           | AF         |          |
| Randomised trials                         |                            |       |                   |                     |     |              |            |          |
| Dries <i>et al</i> <sup>[25]</sup>        | SOLVD                      | 6517  | < 35%             | 2.8                 | 6%  | 1395 (23)    | 149 (34)   | < 0.0001 |
| Olsson <i>et al</i> <sup>[26]</sup>       | CHARM                      | 7601  | All LVEF included | 3.1                 | 15% | 1466 (23)    | 365 (32)   | < 0.001  |
| Swedberg <i>et al</i> <sup>[38]</sup>     | COMET                      | 3029  | < 35%             | 4.8                 | 20% | 874 (36)     | 258 (43)   | < 0.0005 |
| Carson <i>et al</i> <sup>[109]</sup>      | V-HEFT I&II                | 1427  | < 45%             | 2.5                 | 19% | 480 (39)     | 75 (36)    | NS       |
| Mathew <i>et al</i> <sup>[110]</sup>      | DIG                        | 7788  | All LVEF included | 3.1                 | 11% | 2231 (32)    | 375 (43)   | < 0.0001 |
| Crijns <i>et al</i> <sup>[111]</sup>      | PRIME II                   | 409   | < 35%             | 3.4                 | 21% | 153 (47)     | 50 (60)    | < 0.05   |
| Pederson <i>et al</i> <sup>[112]</sup>    | DIAMOND                    | 3587  | < 35%             | N/A                 | 24% | 1951 (73)    | 634 (77)   | < 0.001  |
| Observational studies                     |                            |       |                   |                     |     |              |            |          |
| Rivero-Ayerza <i>et al</i> <sup>[5]</sup> | EuroHeart Failure Survey   | 10701 | All LVEF included | N/A                 | 43% | 419 (7)      | 372 (8)    | < 0.05   |
| Ahmed <i>et al</i> <sup>[28]</sup>        | Medicare AL                | 944   | All LVEF included | 4.0 yr              | 27% | 439 (62)     | 166 (71)   | < 0.01   |
| Mahoney <i>et al</i> <sup>[37]</sup>      | Heart Transplantation      | 234   | < 45%             | 1.1 yr              | 27% | 26 (15)      | 14 (22)    | NS       |
| Middlekauff <i>et al</i> <sup>[113]</sup> | Heart Transplantation      | 390   | < 35%             | 265 d               | 19% | 123 (29)     | 36 (48)    | < 0.005  |
| Stevenson <i>et al</i> <sup>[114]</sup>   | Heart Transplantation      | 750   | < 40%             | 2.0 yr              | 22% | 336 (45)     | 104 (61)   | < 0.01   |
| Wojtkowska <i>et al</i> <sup>[115]</sup>  | Bilastok, Poland           | 120   | < 30%             | 3.0 yr              | 50% | 26 (43)      | 33 (55)    | NS       |
| Corell <i>et al</i> <sup>[116]</sup>      | Danish HF clinic Network   | 1019  | < 45%             | 1.9 yr              | 26% | 180 (24)     | 89 (33)    | < 0.05   |
| Pai <i>et al</i> <sup>[117]</sup>         | Loma Linda VA              | 8931  | All LVEF included | 2.5 yr              | 18% | 2164 (28)    | 529 (44)   | < 0.0001 |
| Rusinaru <i>et al</i> <sup>[118]</sup>    | Somme, France              | 368   | > 50%             | N/A                 | 36% | 125 (53)     | 84 (64)    | < 0.05   |
| Hamaguchi <i>et al</i> <sup>[119]</sup>   | Japanese Registry data     | 2659  | All LVEF included | 2.4 yr              | 35% | N/A          | N/A        | NS       |
| Shotan <i>et al</i> <sup>[120]</sup>      | National HF Survey, Israel | 4102  | All LVEF included | 4                   | 33% | 1480 (54.3)  | 882 (64.9) | 0.000    |

Düzensiz LV doluşu , atriyal katkı olmaması ve kardiyak outputda azalma  
Retrospektif çalışmalar sinüs ritminin devamı ile sağkalımda  
kardiyak fonksiyonları kötü etkiler

Kardiyoverسیون sonrası Kardiyak fonksiyonlar düzelir

SAĞKALIMLA ilişkili olduğu aşlında AAD etkinliğinin  
DÜŞÜK olduğu GÖSTERİLMİŞ

«Dries DL, Exner DV, Gersh BJ, Domanski MJ, Waclawiw MA, Stevenson LW. Atrial fibrillation is associated with an increased risk for mortality and heart failure progression in patients with asymptomatic and symptomatic left ventricular systolic dysfunction: results from the SOLVD trials. *Studies of Left Ventricular Dysfunction*. *J Am Coll Cardiol*. 1998;31:1436–1438. [CrossRef](#) [PubMed](#) [Google Scholar](#)

«Middlekauff HR, Stevenson WG, Stevenson LW. Prognosis of patients with advanced heart failure. A study of 390 patients. *Circulation*. 1998;98:2574–2579. [Abstract/FREE Full Text](#) [Google Scholar](#)

«Deedwania PC, Singh BN, Ellenbogen K, Fisher S, Fletcher R, Singh SN. Spontaneous conversion and maintenance of sinus rhythm by amiodarone in patients with heart failure and atrial fibrillation: observations from the veterans affairs congestive heart failure survival trial of antiarrhythmic therapy (CHF-STAT). The Department of Veterans Affairs CHF-STAT Investigators. *Circulation*. 1998;98:2574–2579. [Abstract/FREE Full Text](#) [Google Scholar](#)

17. Corley SD, Epstein AE, DiMarco JP, et al. Relationships between sinus rhythm, treatment, and survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study. *Circulation*. 2004;109:1509–13.

«Pedersen OD, Bagger H, Keller N, Marchant B, Køber L, Torp-Pedersen C. Efficacy of dofetilide in the treatment of atrial fibrillation-flutter in patients with reduced left ventricular function: a Danish investigation of arrhythmia and mortality on dofetilide (diamond) substudy. *Circulation*. 2000;102:2649–2655. [Abstract/FREE Full Text](#) [Google Scholar](#)

6. [Abstract/FREE Full Text](#) [Google Scholar](#)

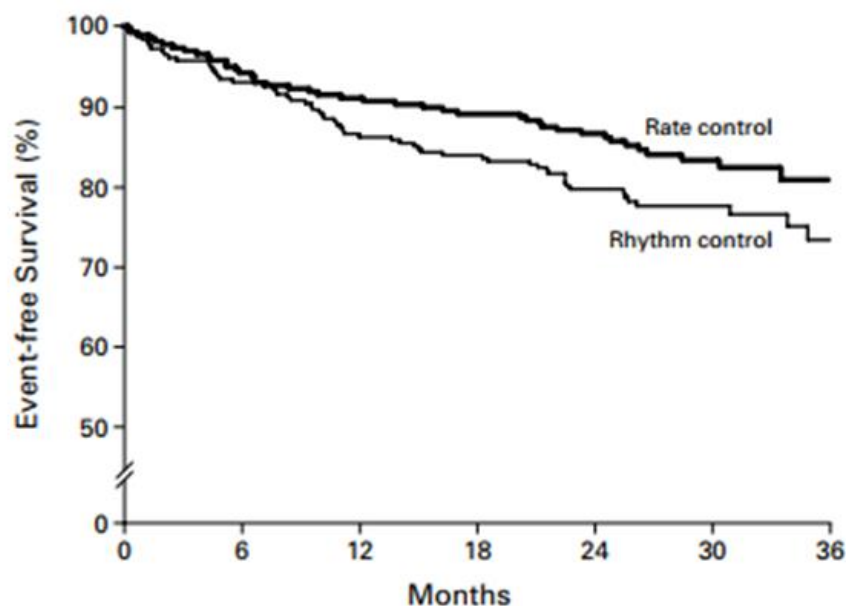
«Roy D, Frasure-Smith N, Talajic M, Lesperance F, Blondeau L, Dorian P, et al. Quality of life and functional capacity in patients with atrial fibrillation and congestive heart failure. *J Am Coll Cardiol*. 2013;61:455–460. [CrossRef](#) [PubMed](#)

«Edvardsson N, Rosenqvist M. The prognosis of patients with atrial fibrillation and sinus rhythm is restored: report from the Stockholm Cohort of Atrial Fibrillation (SCAF). *Heart*. 2009;95:1000–1005. [Abstract/FREE Full Text](#) [Google Scholar](#)

«Corley SD, Epstein AE, DiMarco JP, Domanski MJ, Geller N, Greene HL, Josephson RA, Kellen JC, Klein RC, Krahn AD, Mickel M, Mitchell LB, Nelson JD, Rosenberg Y, Schron E, Shemanski L, Waldo AL, Wyse DG; AFFIRM Investigators. Relationships between sinus rhythm, treatment, and survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study. *Circulation*. 2004;109:1509–1513. [Abstract/FREE Full Text](#) [Google Scholar](#)

## A COMPARISON OF RATE CONTROL AND RHYTHM CONTROL IN PATIENTS WITH RECURRENT PERSISTENT ATRIAL FIBRILLATION

ISABELLE C. VAN GELDER, M.D., VINCENT E. HAGENS, M.D., HANS A. BOSKER, M.D., J. HERRE KINGMA, M.D., OTTO KAMP, M.D., TSJERK KINGMA, M.Sc., SALAH A. SAID, M.D., JULIUS I. DARMANATA, M.D., ALPHONS J.M. TIMMERMANS, M.D., JAN G.P. TIJSSEN, Ph.D., AND HARRY J.G.M. CRIJNS, M.D.,  
FOR THE RATE CONTROL VERSUS ELECTRICAL CARDIOVERSION FOR PERSISTENT ATRIAL FIBRILLATION STUDY GROUP\*



No. AT Risk

|                |     |     |     |     |     |    |    |
|----------------|-----|-----|-----|-----|-----|----|----|
| Rate control   | 256 | 239 | 232 | 222 | 212 | 99 | 25 |
| Rhythm control | 266 | 243 | 224 | 218 | 207 | 85 | 24 |

**Figure 2.** Kaplan–Meier Curves for Event-free Survival in the Rate-Control and Rhythm-Control Groups.

A Comparison of Rate Control and Rhythm Control in Patients with Atrial Fibrillation. N Engl J Med 2002; 347: pp. 1825-1833

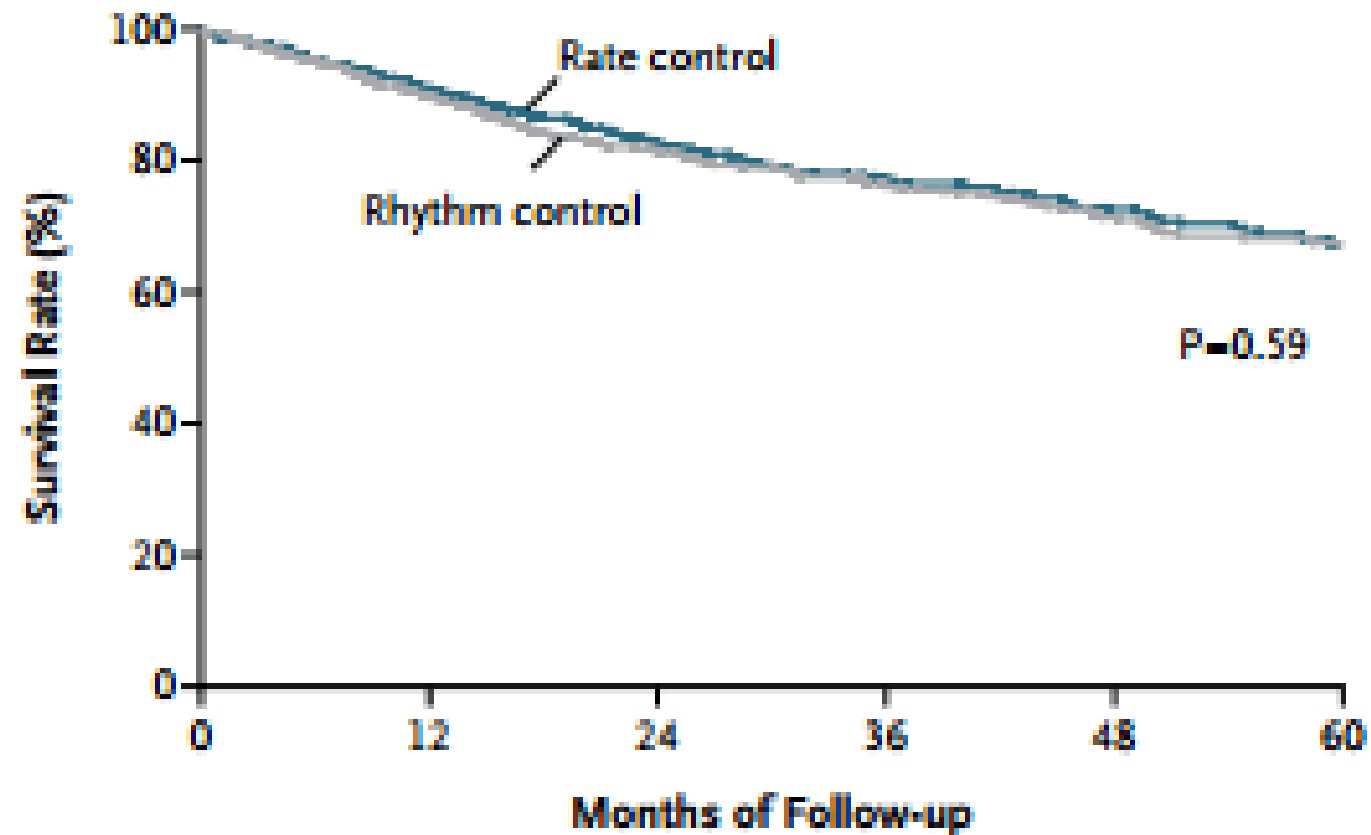
**Yan etkilerin getireceđi zarar  
faydaların üzerine çıkabilmektedir**

**ZATEN ÇOĐU ANTİ ARİTMİK KY'DE KONTRAENDİKEDİR**

17. Corley SD, Epstein AE, DiMarco JP, et al. Relationships between sinus rhythm, treatment, and survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study. Circulation 2004;109:1509-13.

with recurrent persistent atrial fibrillation. N Engl J Med 2002; 347: pp. 1834-1840

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No. at Risk

Rhythm control

593

514

378

228

82

Rate control

604

521

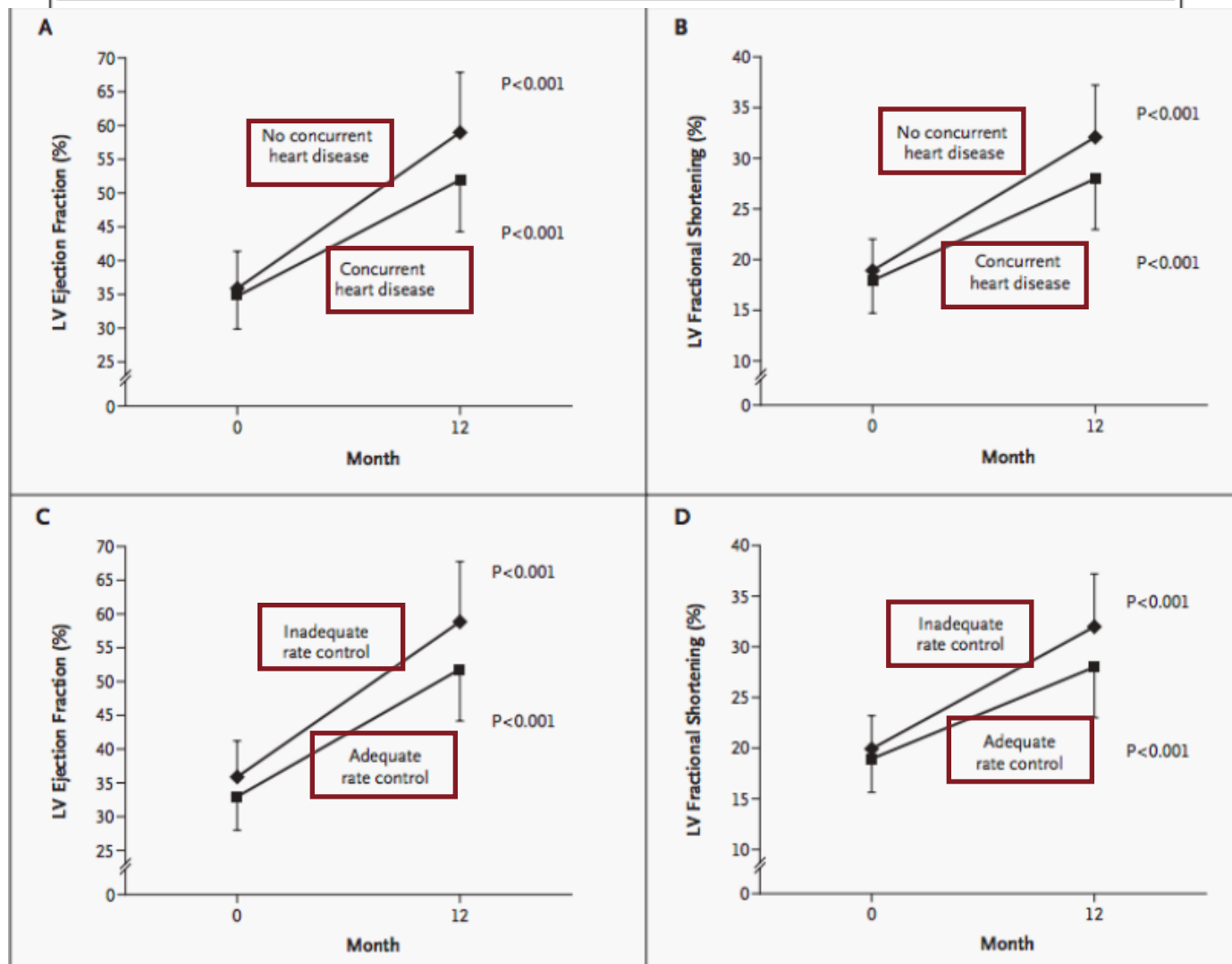
381

219

69



# The NEW ENGLAND JOURNAL of MEDICINE



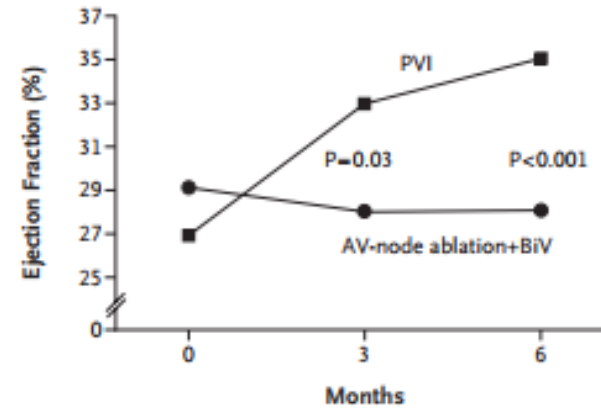
## ORIGINAL ARTICLE

## Pulmonary-Vein Isolation for Atrial Fibrillation in Patients with Heart Failure

N ENGL J MED 359:17 WWW.NEJM.ORG OCTOBER 23, 2008

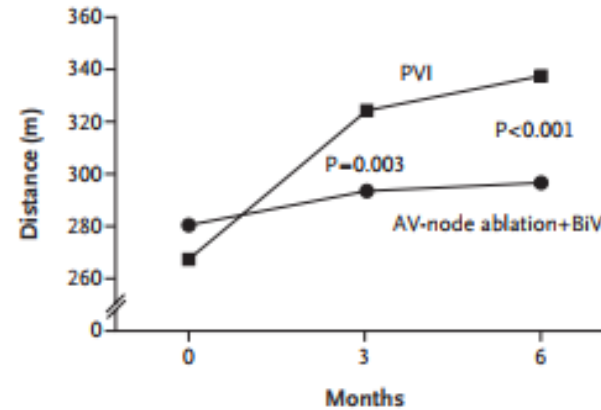
The PABA-CHF study was a multicenter, randomized, controlled trial comparing pulmonary-vein isolation with atrioventricular-node biventricular pacing. We studied patients with symptomatic atrial fibrillation and symptoms of New York Heart Association (NYHA) class II or III heart failure, despite the use of antiarrhythmic medications. Pa-

A Ejection Fraction



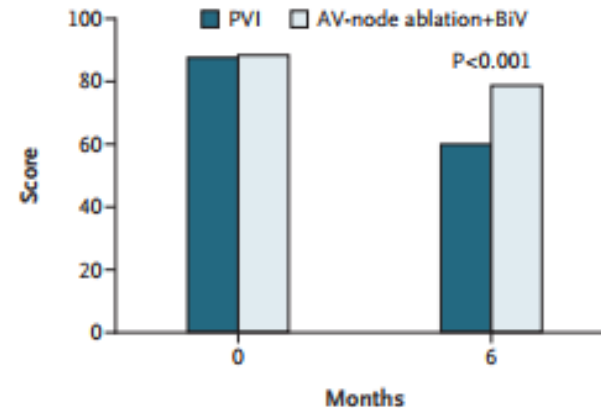
ARTIŞ

B 6-Minute Walk



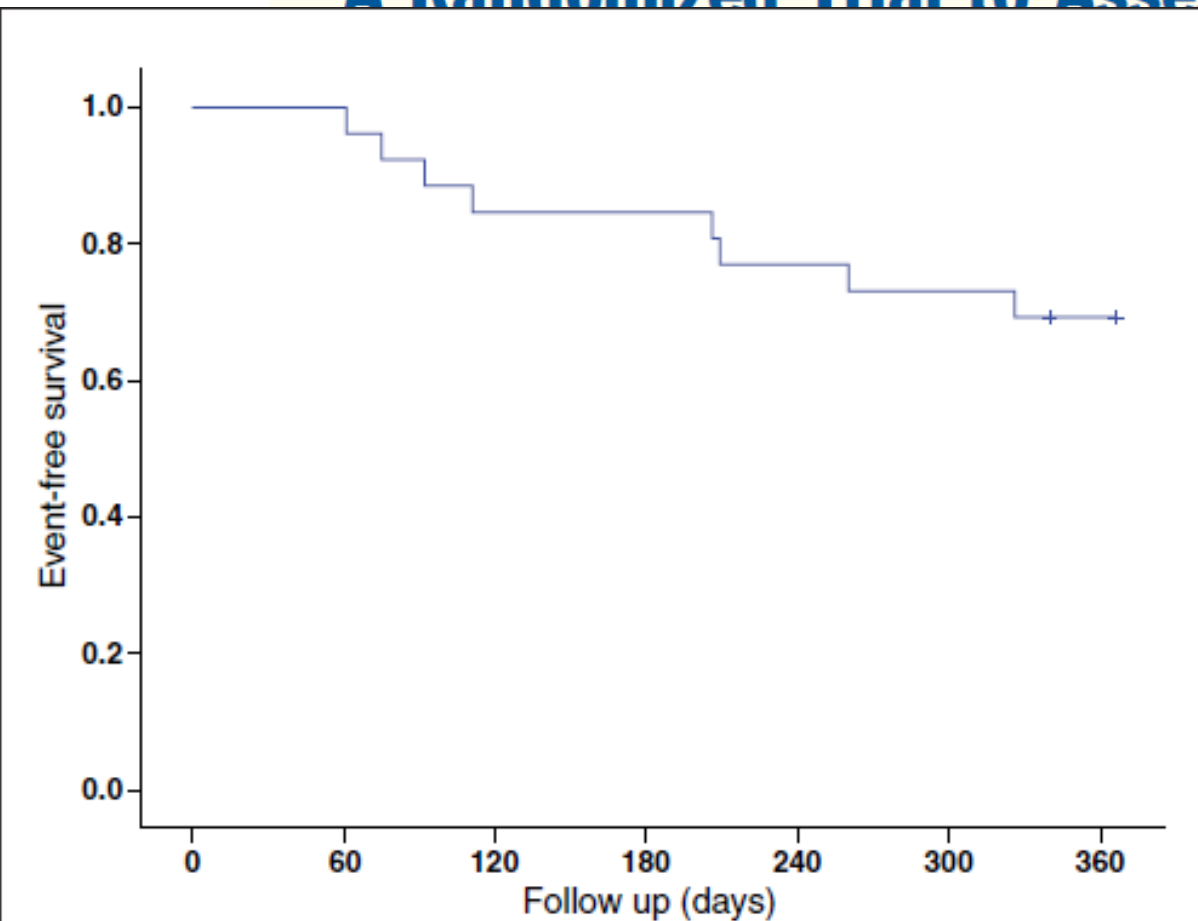
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C Minnesota Living with Heart Failure Questionnaire



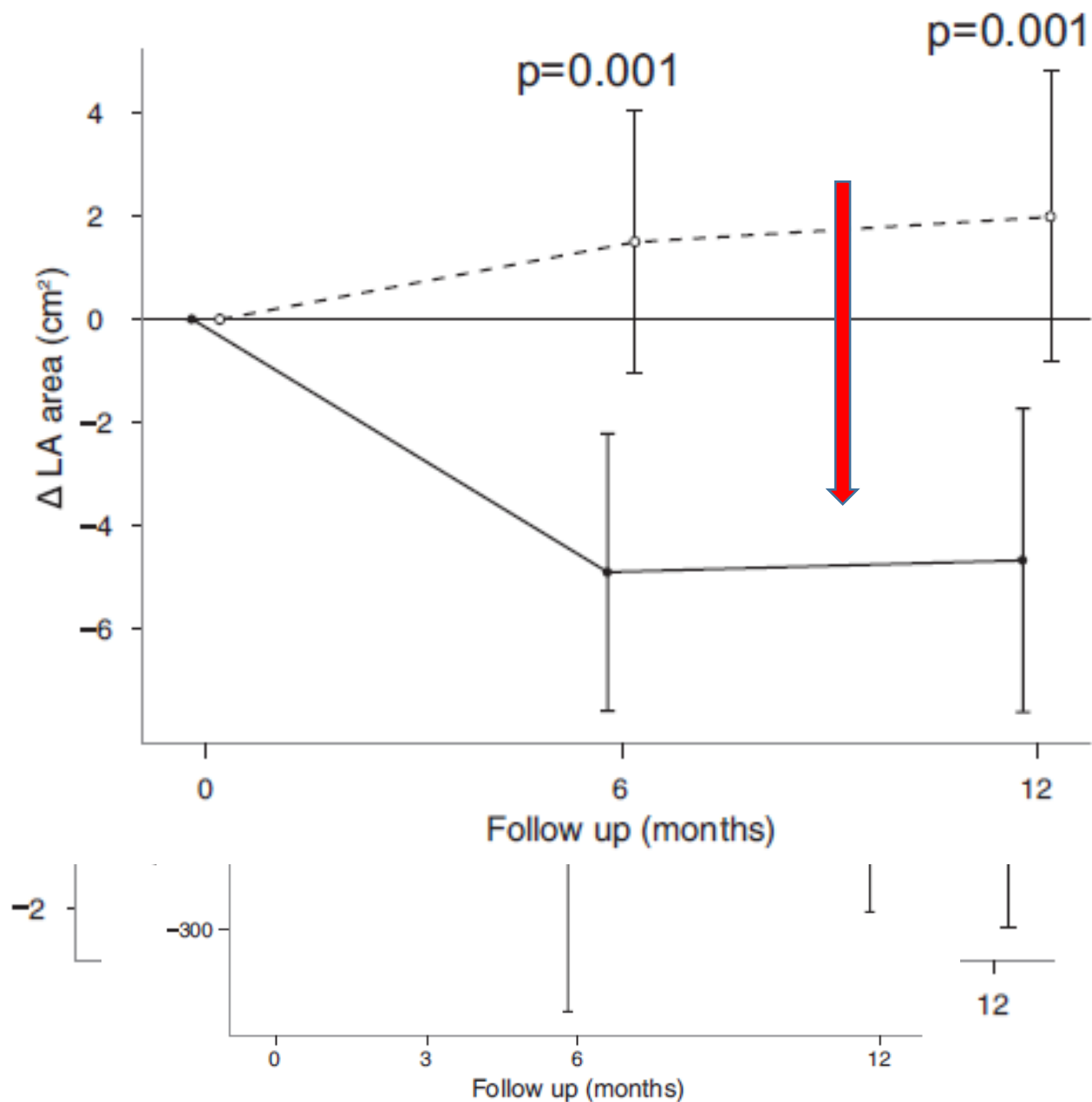
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## A Randomized Trial to Assess

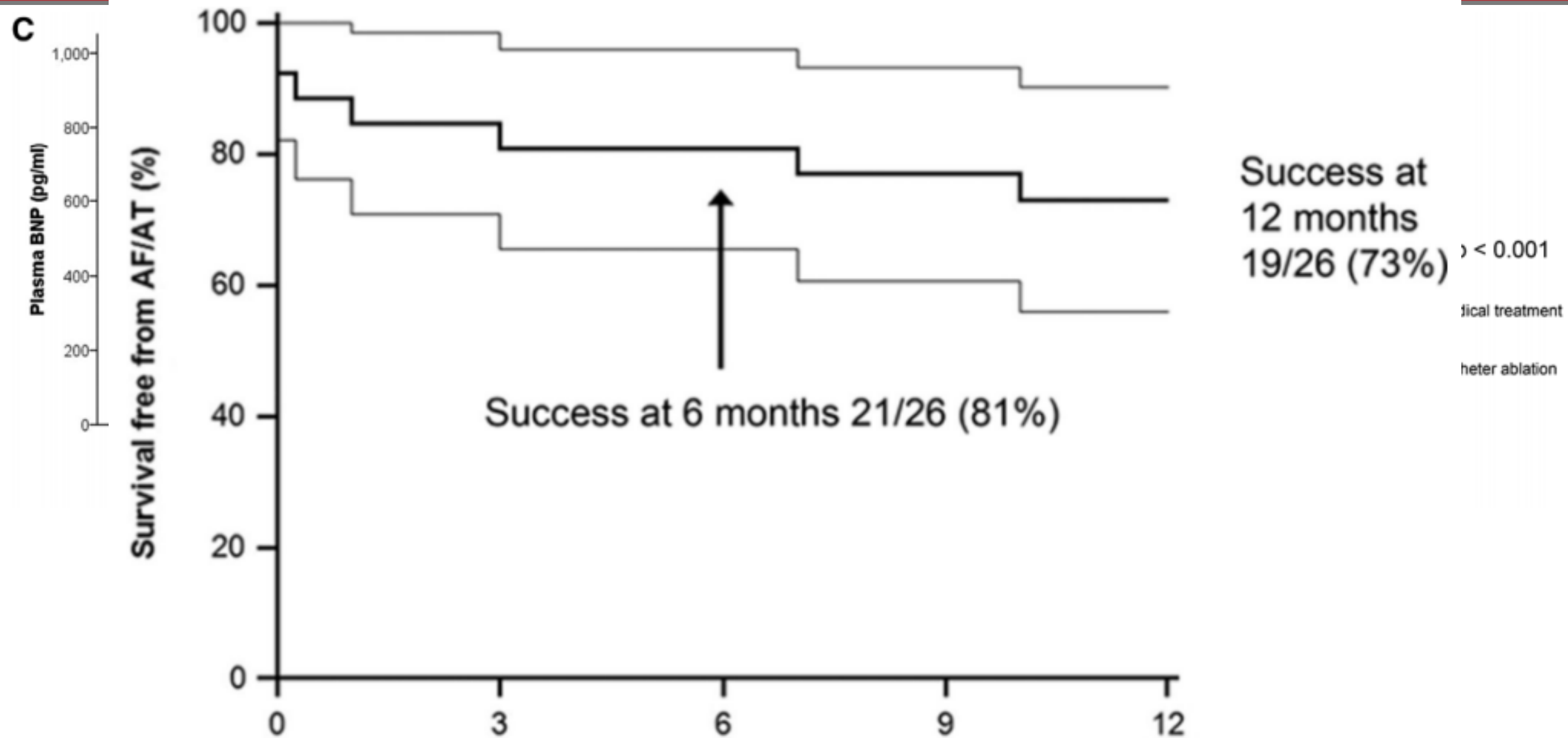


**Figure 6**

**Single Procedure Atrial  
Arrhythmia-Free Survival at 1 Year**



# Circulation: Arrhythmia and Electrophysiology







# Catheter Ablation for Atrial Fibrillation in Heart Failure Patients

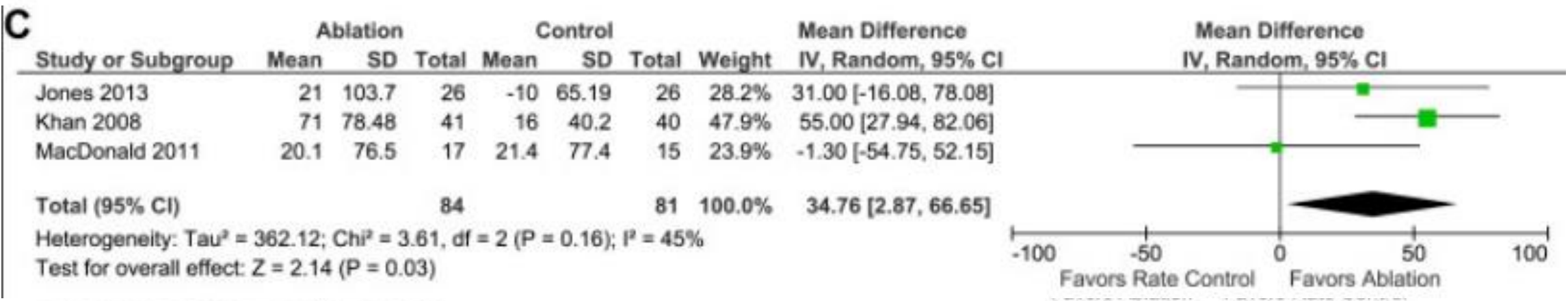


Shadi Al Halabi MD, MPH, Mohammed Qintar MD, Ayman Hussein MD, M. Chadi Alraies MD, David G. Jones MD, Tom Wong MD, Michael R. MacDonald MD, Mark C. Petrie MD, Daniel Cantillon MD, Khaldoun G. Tarakji MD, MPH, Mohamed Kanj MD, Mandeep Bhargava MD, Niraj Varma MD, Bryan Baranowski MD, Bruce L. Wilkoff MD, Oussama Wazni MD, Thomas Callahan MD, Walid Saliba MD and Mina K. Chung MD

JACC: Clinical Electrophysiology, 2015-06-01, Volume 1, Issue 3, Pages 200-209, Copyright © 2015 American College of Cardiology Foundation



JACC: Clinical Electrophysiology



# Circulation: Arrhythmia and Electrophysiology

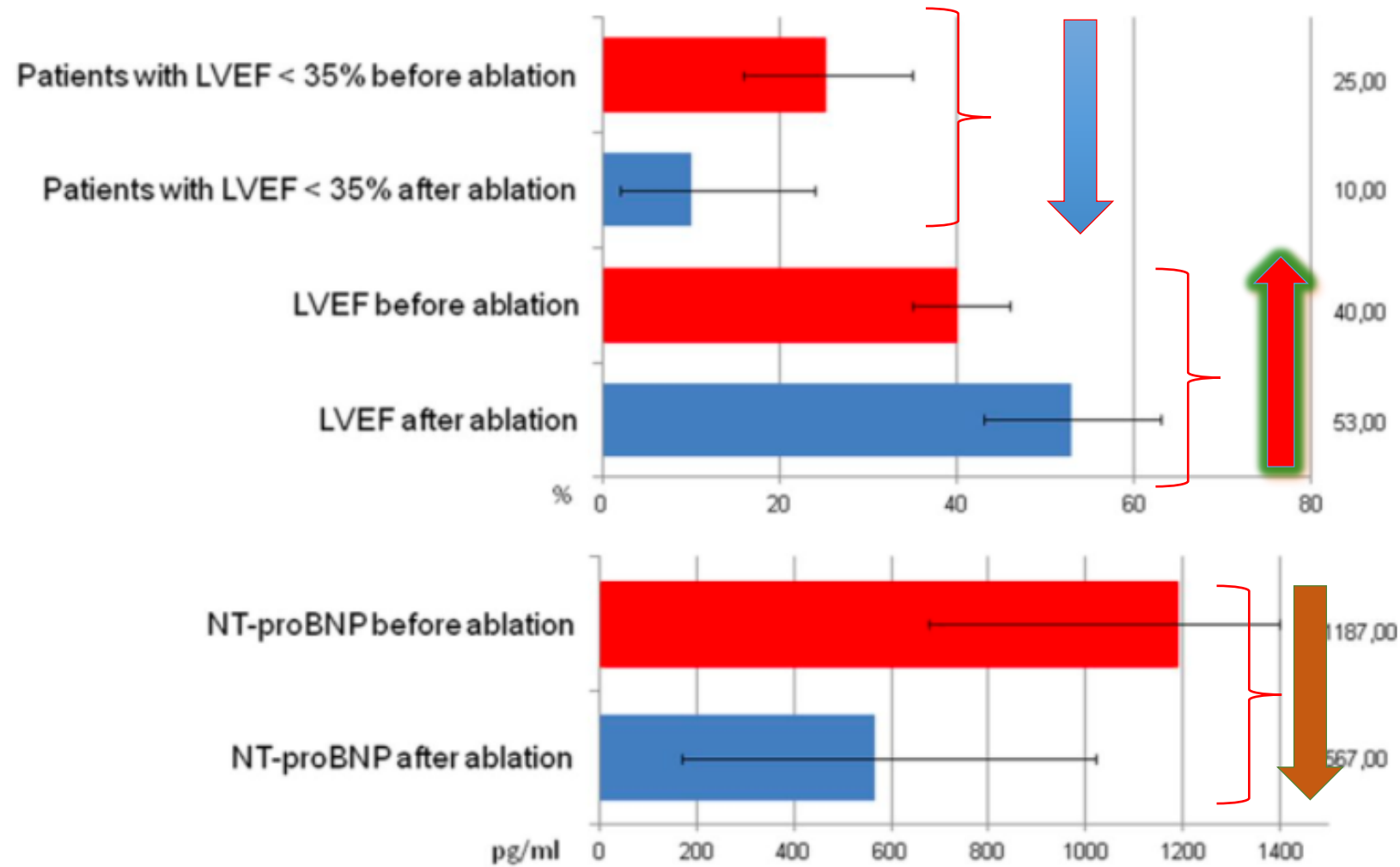
Hello, Guest!

MY ALERTS

SIGN IN

JOIN

SIGN OUT



# Circulation

HOME

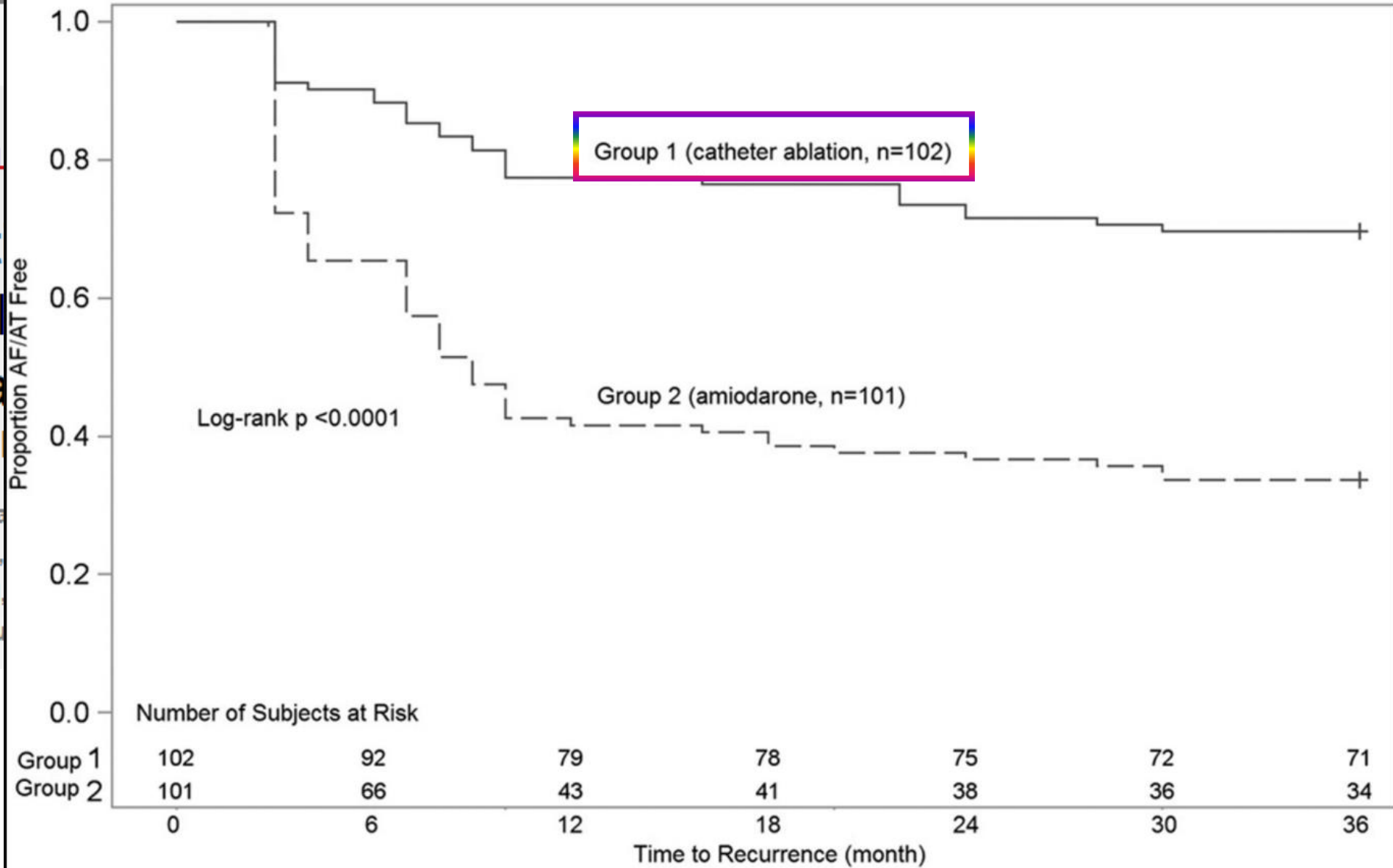
ORIGINAL

Ablat  
Fibrill  
Impla  
Results

Luigi Di Bia  
Pierre Jais,  
Petr Neuzil,  
J. David Bu

AHA JOURNALS ▼

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ikert,  
dio Tondo,



# Ablasyon grubunun %40 işlem için yatışı sayılmamış

Change in LVEF, 6MWD, and MLHFQ Score by Recurrence Status

**Amiodarone**

**ilaç etkileşimi**

**Toksite**

**Pace ihtiyacı artışı**

**Plasebodan farkı yok**

**Mortalite az sayıdaki olay üzerinden değerlendirilmiş ve**

**Amiodarone mortaliteyi artırabilmekte**

Roy D, Talajic M, Nattel S, Wyse DG, Dorian P, Lee KL, Bourassa MG, Arnold JM, Buxton AE, Camm AJ, Connolly SJ, Dubuc M, Ducharme A, Guerra PG, Hohnloser SH, Lambert J, Le Heuzey JY, O'Hara G, Pedersen OD, Rouleau JL, Singh BN, Stevenson LW, Stevenson WG, Thibault B, Waldo AL; Atrial Fibrillation and Congestive Heart Failure Investigators. Rhythm control versus rate control for atrial fibrillation and heart failure. *N Engl J Med*. 2008;358:2667-2677. doi: 10.1056/NEJMoa0708789. [CrossRef](#) [PubMed](#)

[Google Scholar](#)

6MWD

Hospitalization rate; ↓,  $P < 0.001$

Mortality: ↓,  $P = 0.037$

MLHFQ

Bardy GH, Lee KL, Mark DB, Poole JE, Packer DL, Boineau R, Domanski M, Troutman C, Anderson J, Johnson G, McNulty SE, Clapp-Channing N, Davidson-Ray LD, Fraulo ES, Fishbein DP, Luceri RM, Ip JH; Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT) Investigators. Amiodarone or an implantable cardioverter-defibrillator for congestive heart failure. *N Engl J Med*. 2005;352:225-237. doi: 10.1056/NEJMoa043399. [CrossRef](#)

[PubMed](#) [Google Scholar](#)

<0.001

FULL TEXT ARTICLE



# Catheter Ablation Versus Medical Rate Control in Atrial Fibrillation and Systolic Dysfunction

Sandeep Prabhu MBBS, Andrew J. Taylor MBBS, PhD, Ben T. Costello MBBS, David M. Kaye MBBS, PhD, Alex J.A. McLellan MBBS, PhD, Aleksandr Voskoboinik MBBS, Hariharan Sugumar MBBS, Siobhan M. Lockwood MBBS, Michael B. Stokes MBBS, Bhupesh Pathik MBBS, Chrishan J. Nalliah MBBS, Geoff R. Wong MBBS, Sonia M. Azzopardi RN, Sarah J. Gutman MBBS, Geoffrey Lee MBBS, PhD, Jamie Layland MBChB, PhD, Justin A. Mariani MBBS, PhD, Lianghan Ling MBBS, PhD, Jonathan M. Kalman MBBS, PhD and Peter M. Kistler MBBS, PhD



JACC (Journal  
of the American  
College of  
Cardiology)

Volume 70, Issue 16

EF %45 >  
Persistant AF  
Bilinen nedeni olmayan sistolik KY

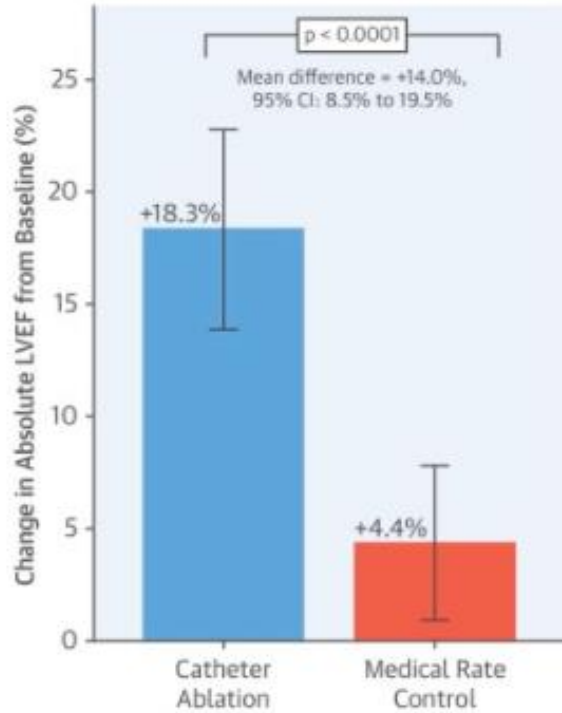
- MRI ile ventriküler fibrozis varlığı
- Ablasyon Grubu Imp. Loop. Record.



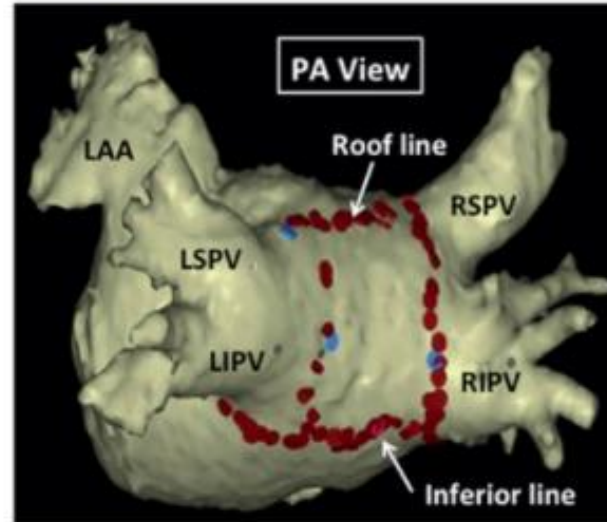
|                                              |                                                                                               |                                                                                               |
|----------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| AF history                                   |                                                                                               |                                                                                               |
| Mean duration of continuous AF, months       | 23 ± 18    | 21 ± 15    |
| Longstanding persistent AF                   | 72 (24)    | 76 (25)    |
| Previous DCCV                                | 97 (32)    | 94 (31)    |
| Average no. of DCCV attempts per patient     | 2.1 ± 0.8  | 2.0 ± 0.7  |
| Amiodarone therapy ineffective or intolerant | 91 (30)    | 82 (27)    |
| Resting HR, beats/min                        | 79 ± 17   | 77 ± 19   |
| 24-h average HR, beats/min                   | 86 ± 14  | 85 ± 17  |
| Post-6MWT HR, beats/min                      | 93 ± 23  | 95 ± 20  |

**CENTRAL ILLUSTRATION: Change in Absolute LVEF From Baseline According to Treatment Arm**

**A** Primary Endpoint: Change in LVEF at Baseline and 6 Months by Treatment Arm



**B** Catheter Ablation Lesion Set in Left Atrium: Pulmonary Vein and Posterior Wall Isolation



Prabhu, S. et al. J Am Coll Cardiol. 2017;70(16):1949-61.

Ablasyon grubunda MR ile EF

%58 hastada EF %50 < EF %35 > %52----->%9

Hız kontrol grubunda MR ile EF

%9 hastada EF %50 < EF %35 > %45--->%36

|                                               | Catheter Ablation<br>(n = 33) |               | Medical Rate Control<br>(n = 33) |               | Comparison Between<br>Treatment Arms |           |   |
|-----------------------------------------------|-------------------------------|---------------|----------------------------------|---------------|--------------------------------------|-----------|---|
| Secondary endpoints                           | Baseline                      | 6 Months      | Baseline                         | 6 Months      | Mean Difference                      | p Value * |   |
| LVEF (echocardiography),<br>%                 | 35.0 ± 9.8                    | 52.7 ± 11.9 † | 34.8 ± 43.7                      | 43.7 ± 12.7 ± | 7.5 (1.6 to 13.5)                    | 0.0137    | ← |
| LV end-systolic volume,<br>ml/m <sup>2</sup>  | 79.5 ± 33.3                   | 55.3 ± 30.5 † | 76.3 ± 27.2                      | 68.2 ± 26.3 § | -16.1 (-27.7 to -4.5)                | 0.0075    | ← |
| LV end-diastolic volume,<br>ml/m <sup>2</sup> | 114 ± 40                      | 106 ± 33 §    | 113 ± 32                         | 109 ± 39      | -2.1 (-14.5 to 10.4)                 | 0.74      |   |
| LA volume, ml/m <sup>2</sup>                  | 54.4 ± 16.1                   | 43.4 ± 13.3 † | 53.9 ± 18.9                      | 55.6 ± 14.6   | -13.4 (-20.4 to -6.5)                | 0.0003    | ← |
| LV stroke volume, ml/m <sup>2</sup>           | 34.9 ± 12.7                   | 50.5 ± 10.1 † | 38.6 ± 12.5                      | 40.5 ± 14.8   | -16.1 (-27.7 to -4.45)               | <0.0001   | ← |
| Average NYHA functional<br>class              | 2.55 ± 0.62                   | 1.33 ± 0.48 † | 2.45 ± 0.56                      | 2.06 ± 0.50 ± | -0.82 (-1.13 to -0.51)               | <0.0001   | ← |
| BNP, log[ng/l]                                | 2.34 ± 0.38                   | 1.84 ± 0.37 † | 2.27 ± 0.43                      | 2.14 ± 0.56   | -0.38 (-0.65 to -0.11)               | 0.0063    | ← |
| BNP, ng/l ¶                                   | 266 ± 210                     | 98 ± 77       | 256 ± 208                        | 247 ± 197     | –                                    | 0.0131    | ← |
| 6MWT distance, m                              | 491 ± 147                     | 546 ± 82 §    | 489 ± 132                        | 518 ± 119 †   | 27 (-28 to 79)                       | 0.34      |   |

|                                                | Ablasyon grubu                                      |                          | Mean Difference     | p Value |
|------------------------------------------------|-----------------------------------------------------|--------------------------|---------------------|---------|
|                                                | LGE Positive<br>(n = 14)                            | LGE Negative<br>(n = 22) |                     |         |
| Patients undergoing catheter ablation (n = 36) | LV EF 35 > 50<br>LGE(-) %50<br>Multivariable analiz |                          |                     |         |
| Baseline LVEF, %                               | 32.4 ± 9.7                                          | 31.7 ± 9.4               | 0.4 (-5.9 to 6.8)   | 0.89    |
| 6 month LVEF, %                                | 43.7 ± 14.2                                         | 34.0 ± 8.5               | 10.3 (3.3 to 17.0)  | 0.0036  |
| Change in LVEF from baseline, %                | 11.6 ± 16.3                                         | 22.3 ± 14.3              | 10.7 (3.2 to 18.3)  | 0.0069  |
| LVEF ≥50% at 6 months                          | 29 (4)                                              | 73 (16)                  | 44.2 (10.7 to 66.1) | 0.0093  |
| Improvement in LVEF by ≥15%                    | 29 (4)                                              | 82 (18)                  | 53.2 (20.2 to 73.3) | 0.0014  |

EF düzelmesi için prediktör  
 LV EF 35 > 50  
 LGE varlığı  
 LGE(+) %64 ---> %21

| Comparison between treatment arms<br>(catheter ablation and medical rate control) |  | Mean Difference | 95% CI       | p Value |
|-----------------------------------------------------------------------------------|--|-----------------|--------------|---------|
| LGE positive                                                                      |  |                 |              |         |
| Change in LVEF from baseline                                                      |  | 6.8             | -1.5 to 15.0 | 0.10    |
| LVEF $\geq$ 50% at 6 months                                                       |  | 29              | -3.9 to 54.7 | 0.06    |
| LGE negative                                                                      |  |                 |              |         |
| Change in LVEF from baseline                                                      |  | 19.8            | 13.1 to 26.4 | <0.0001 |
| LVEF $\geq$ 50% at 6 months                                                       |  | 63              | 30.0 to 80.4 | <0.0001 |

FARK  
YOK

FARK  
VAR



# Catheter Ablation versus Standard conventional Treatment in patients with L Eff ventricular dysfunction and At Secondary En

# The CASTLE-AF

# ANA SONLANIM TÜM NEDENLERE BAĞLI ÖLÜM KY BAĞLI HASTANEYE YATIŞ

**persistent**

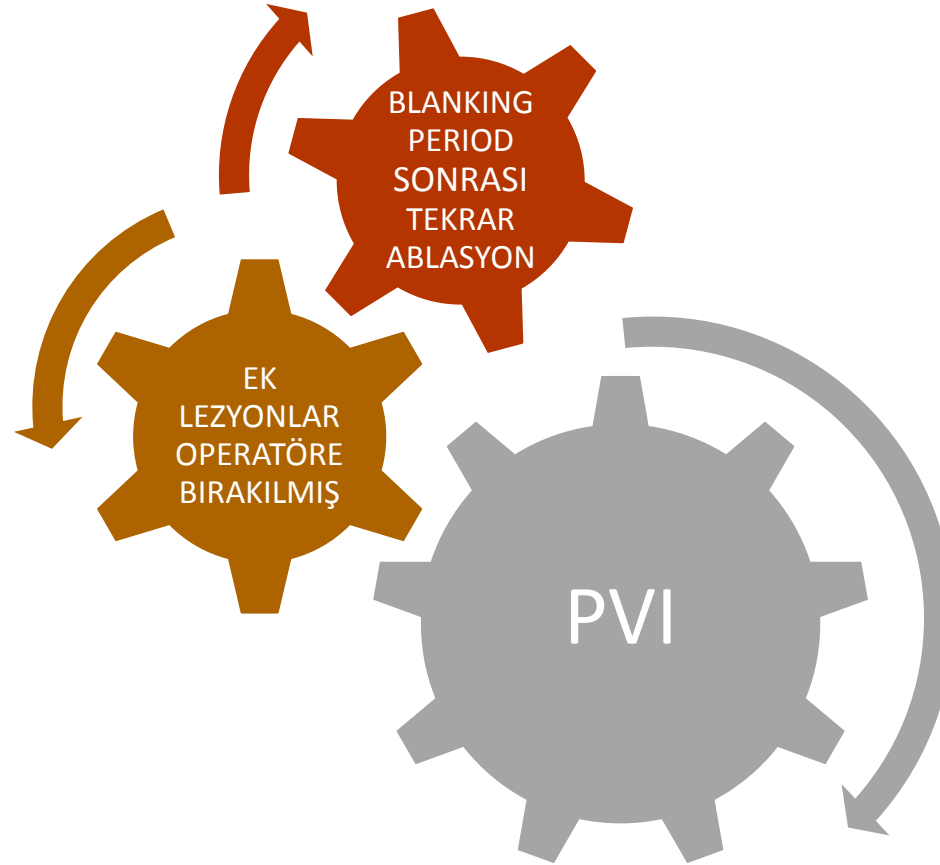
- Failure or intolerance to  $\geq 1$  or unwilling
- LVEF  $\leq 35\%$
- NYHA class  $\geq II$

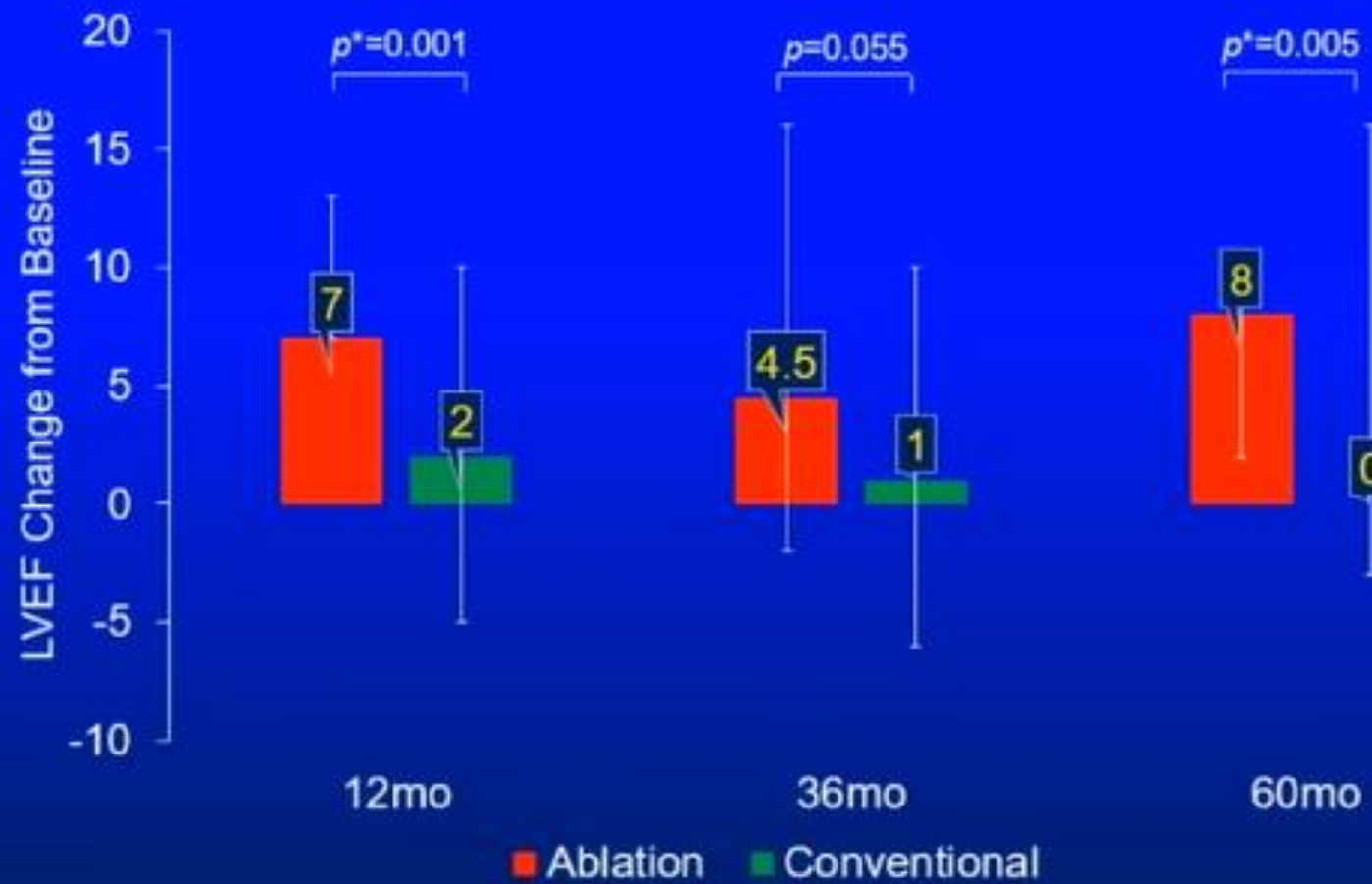
### Secondary Endpoints

- All-cause mortality
- Worsening of heart failure admissions
- Cerebrovascular accidents
- Cardiovascular mortality
- Unplanned hospitalization due to cardiovascular reason
- All-cause hospitalization
- Quality of Life: Minnesota Living with Heart Failure and EuroQoL EQ-5D
- Exercise tolerance (6 minutes walk test)
- Number of delivered ICD shocks, and ATPs (appropriate/inappropriate)
- LVEF
- Time to first ICD shock, and time to first ATP
- Number of device detected VT/VF
- AF burden: cumulative duration of AF episodes
- AF free interval: time to first AF recurrence after 3 months blanking period post ablation

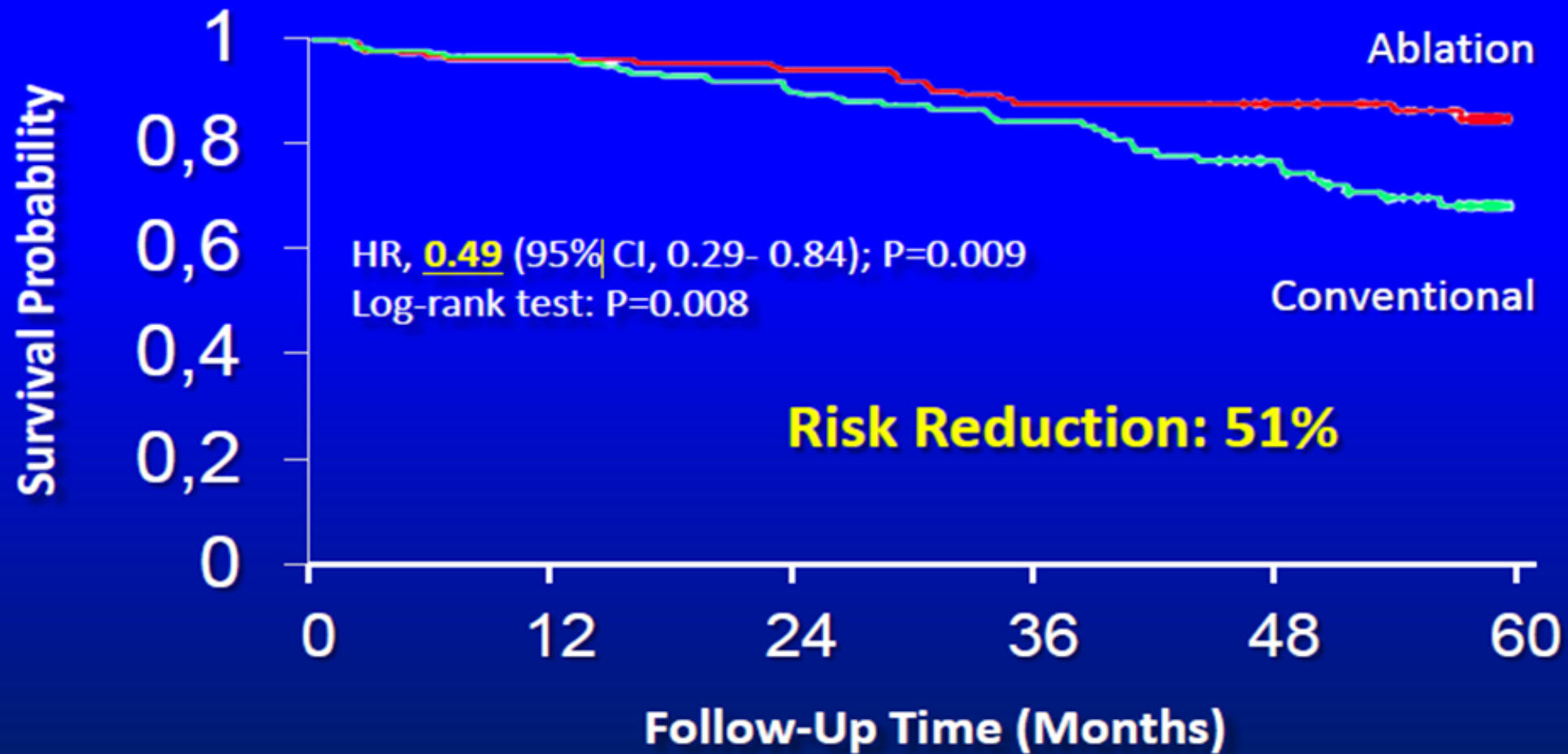
|                                        | Ablation group<br>(179 patients) | Conventional group<br>(184 patients) |
|----------------------------------------|----------------------------------|--------------------------------------|
| Age – years                            | 64 (56-71)                       | 64 (56-73.5)                         |
| New York Heart Association class       |                                  |                                      |
| I (%)                                  | 11                               | 11                                   |
| II (%)                                 | <b>58</b>                        | <b>61</b>                            |
| III (%)                                | 29                               | 27                                   |
| IV (%)                                 | 2                                | 1                                    |
| Left ventricular ejection fraction – % | 32.5 (25.0-38.0)                 | 31.5 (27.0-37.0)                     |
| Current type of atrial fibrillation    |                                  |                                      |
| Paroxysmal (%)                         | <b>30</b>                        | <b>35</b>                            |
| Persistent (%)                         | <b>70</b>                        | <b>65</b>                            |
| CRT-D implanted (%)                    | 27                               | 28                                   |
| ICD implanted (%)                      | 73                               | 72                                   |

# ABLASYON PROTOKOLÜ





# Cardiovascular Mortality





# Primary Endpoint-Subgroups

| Subgroup        | Ablation<br>(n events / n patients) | Conventional<br>(n events / n patients) | Ablation better<br>Conventional better | HR (95% CI)      | p value |
|-----------------|-------------------------------------|-----------------------------------------|----------------------------------------|------------------|---------|
| Type of AF      |                                     |                                         |                                        |                  | 0.90    |
| Paroxysmal      | 17 / 54                             | 34 / 64                                 |                                        | 0.60 (0.34–1.08) |         |
| Persistent      | 34 / 125                            | 48 / 120                                |                                        | 0.64 (0.41–0.99) |         |
| CRT-D implanted |                                     |                                         |                                        |                  | 0.60    |
| No              | 37 / 131                            | 57 / 132                                |                                        | 0.65 (0.43–0.98) |         |
| Yes             | 14 / 48                             | 25 / 52                                 |                                        | 0.54 (0.28–1.04) |         |
| ICD indication  |                                     |                                         |                                        |                  | 0.30    |

Cause of heart failure

0.56

|             |        |       |  |                  |
|-------------|--------|-------|--|------------------|
| Nonischemic | 26/107 | 29/88 |  | 0.74 (0.43–1.25) |
| Ischemic    | 25/72  | 53/96 |  | 0.60 (0.37–0.97) |

|                       |          |          |  |                  |      |
|-----------------------|----------|----------|--|------------------|------|
| Male                  | 42 / 156 | 70 / 155 |  | 0.58 (0.39–0.84) |      |
| Age                   |          |          |  |                  | 0.17 |
| < 65 years            | 18 / 96  | 34 / 99  |  | 0.48 (0.27–0.85) |      |
| >= 65 years           | 33 / 83  | 48 / 85  |  | 0.79 (0.50–1.23) |      |
| NYHA functional class |          |          |  |                  | 0.06 |
| II                    | 20 / 101 | 46 / 109 |  | 0.42 (0.25–0.72) |      |
| III                   | 22 / 50  | 26 / 49  |  | 0.89 (0.51–1.58) |      |
| LVEF                  |          |          |  |                  | 0.01 |
| < 25%                 | 20 / 34  | 15 / 27  |  | 1.36 (0.69–2.65) |      |
| >= 25%                | 29 / 130 | 61 / 145 |  | 0.48 (0.31–0.74) |      |

!!!

0.25 0.50 1.00 2.00 4.00

Etkin /Güvenli/Olumlu

İleri KY fayda pek görmüyor

**HASTA TABANLI YAKLAŞIM**

Hız kontrol tam bir çözüm değil

Taşikardiyomyopati/ Ventriküler Fibrozis