

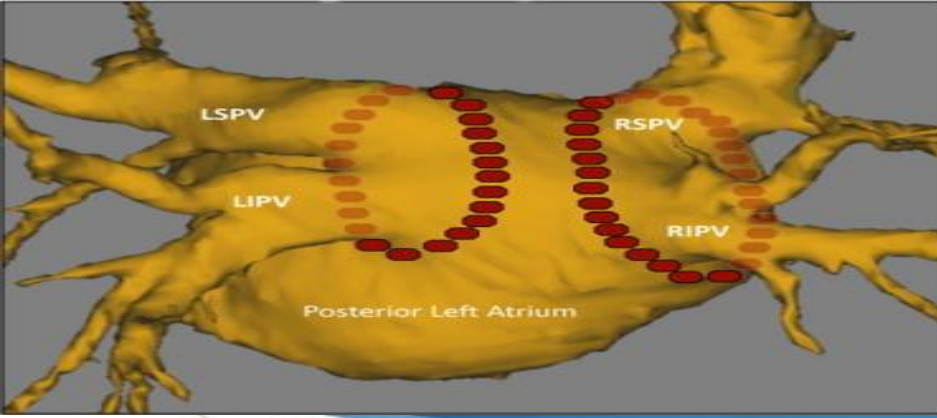
# Atrial Fibrilasyon Ablasyonunun İnme Üzerine Etkisi

Dr. Mustafa Yılmaz

Başkent Üniv. Tıp Fak. Adana Uyg. Arş. Mrkz.

7. Atrial Fibrilasyon Zirvesi  
10 Şubat 2018, Antalya





## ◆ Sunum planı

1. Giriş
2. Paroksizmal veya persistan AF ablasyonu inme riskini azaltır mı?
3. Başarılı ablasyon sonrası antikoagülan tedavi kararı nasıl olmalıdır?
4. AF ablasyonunun periprosüdürel olarak inme üzerine etkisi nasıldır, riski artırır mı?
5. Özet

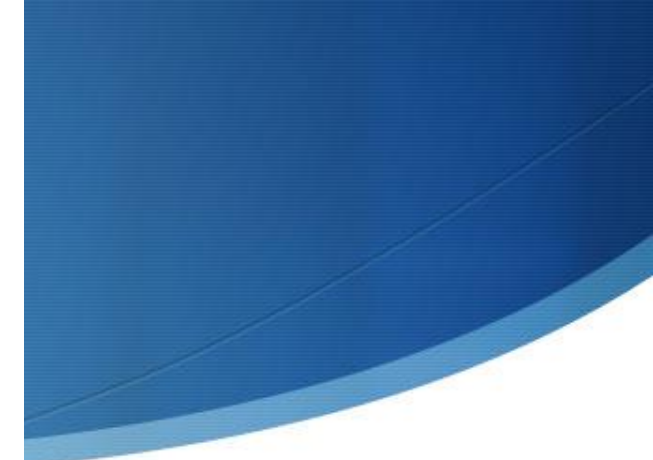
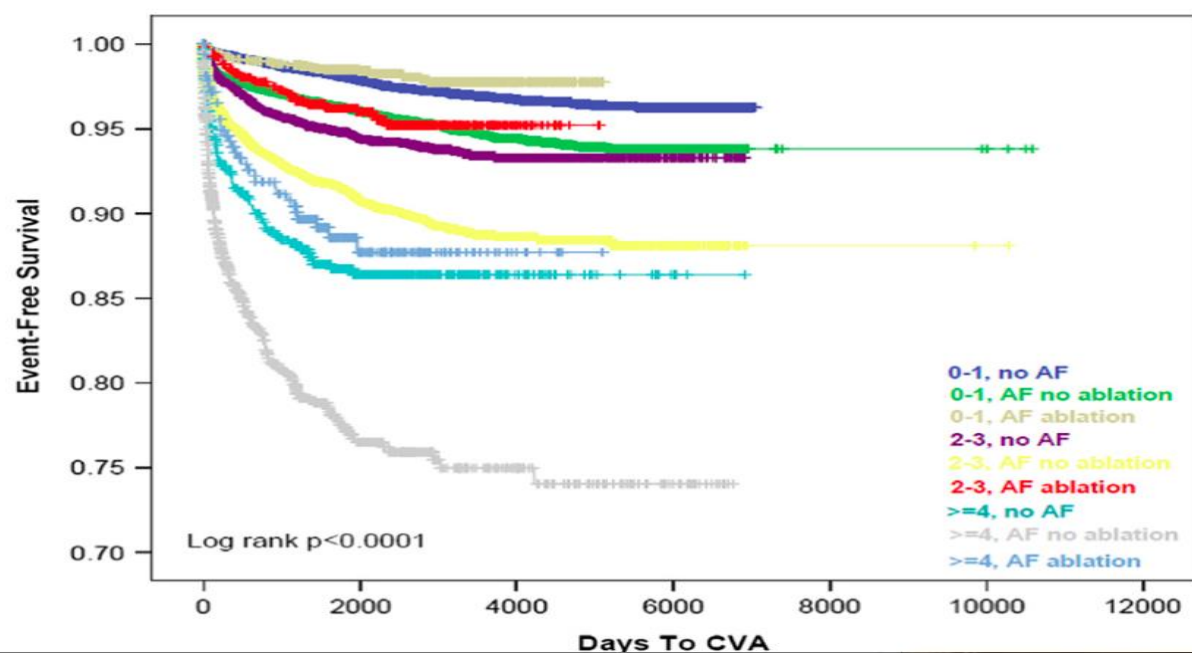
- ◆ AF eriřkinlerde en sık gözlenen kalıcı ritm bozukluęudur.
- ◆ Tüm inmelerin yaklaşık %20-30'u AF den dolayı meydana gelirken, daha büyük çoęunluęuna sessiz paroksismal AF'ler sebep olur.

# Atrial fibrillation ablation patients have long-term stroke rates similar to patients without atrial fibrillation regardless of CHADS2 score

T. Jared Bunch, MD,<sup>\*</sup> Heidi T. May, PhD, MSPH,<sup>\*</sup> Tami L. Bair, BS,<sup>\*</sup> J. Peter Weiss, MD,<sup>\*</sup> Brian G. Crandall, MD,<sup>\*</sup> Jeffrey S. Osborn, MD,<sup>\*</sup> Charles Mallender, MD,<sup>\*</sup> Jeffrey L. Anderson, MD,<sup>\*†</sup> Brent J. Muhlestein, MD,<sup>\*†</sup> Donald L. Lappe, MD,<sup>\*</sup> John D. Day, MD, FHRS<sup>\*</sup>

*From the <sup>\*</sup>Intermountain Heart Institute, Intermountain Medical Center, Murray, Utah, and <sup>†</sup>Department of Medicine, University of Utah, Salt Lake City, Utah.*

- ◆ AF ablasyonu yapılan 4212 hasta
- ◆ AF'si olan ancak ablasyon yapılmayan 16848 hasta
- ◆ AF'si olmayan 16848 hasta
- ◆ En az 3 sene takip
- ◆ Ablasyon yaklaşımı, sonrasında antikoagülasyon ve diğer medikasyonlar takip eden klinisyenin kararı ve belirlenmiş orta bir protokol yok



Age	AF, no ablation	AF, ablation	<i>P</i>	Univariate HR for ablation	Multivariate HR for ablation
<60, n = 5638	3.6%	1.3%	<.0001	0.38, <i>P</i> < .0001	0.38, <i>P</i> < .0001
60-69, n = 5804	5.6%	2.9%	<.0001	0.50, <i>P</i> < .0001	0.59, <i>P</i> = .005
70-79, n = 7082	8.7%	3.8%	<.0001	0.42, <i>P</i> < .0001	0.50, <i>P</i> < .0001
≥80, n = 2536	8.6%	5.8%	.07	0.55, <i>P</i> = .009	0.72, <i>P</i> = .17

**Table 4** CHADS-2 score based long-term stroke rates among AF patients who underwent ablation compared to those AF patients who did not undergo ablation

CHADS2	No AF	AF, no ablation	AF, ablation	<i>P</i> score
0	2.6% (178 of 6902)	3.7% (220 of 6017)	1.6% (26 of 1628)	<.0001
1	3.0% (144 of 4772)	5.4% (243 of 4477)	1.9% (20 of 1050)	<.0001
2	4.3% (129 of 3015)	7.1% (217 of 3072)	2.2% (15 of 696)	<.0001
3	7.4% (108 of 1452)	9.0% (174 of 1939)	6.1% (31 of 512)	.06
4	10.7% (52 of 484)	17.6% (152 of 864)	9.1% (20 of 220)	<.0001
≥5	13.9% (31 of 223)	18.6% (89 of 479)	13.2% (14 of 106)	.18

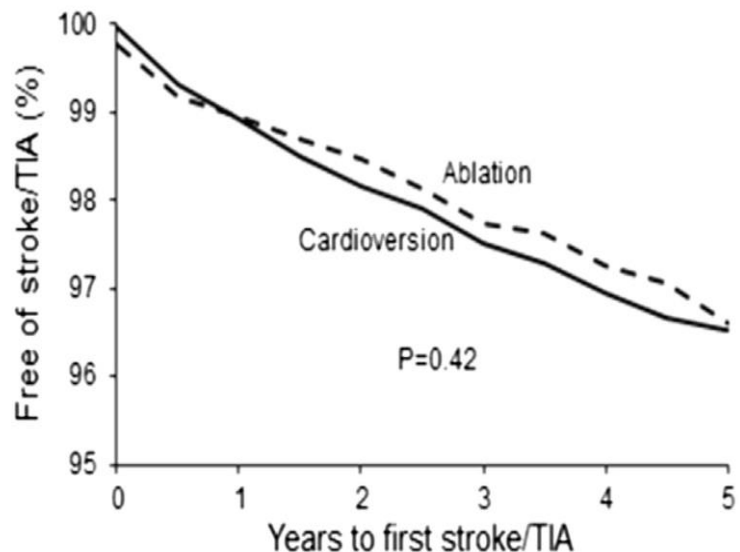
AF = atrial fibrillation

# Risk of stroke after catheter ablation versus cardioversion for atrial fibrillation: A propensity-matched study of 24,244 patients

Peter A. Noseworthy, MD, FHRS,<sup>\*†</sup> Suraj Kapa, MD, FHRS,<sup>\*</sup> Abhishek J. Deshmukh, MBBS,<sup>\*</sup> Malini Madhavan, MD,<sup>\*</sup> Holly Van Houten, BA,<sup>†</sup> Lindsey R. Haas, MPH,<sup>†</sup> Siva K. Mulpuru, MD, FHRS,<sup>\*</sup> Christopher J. McLeod, MBBS, PhD, FHRS,<sup>\*</sup> Samuel J. Asirvatham, MD, FHRS,<sup>\*</sup> Paul A. Friedman, MD, FHRS,<sup>\*</sup> Nilay D. Shah, PhD,<sup>†‡</sup> Douglas L. Packer, MD, FHRS<sup>\*</sup>

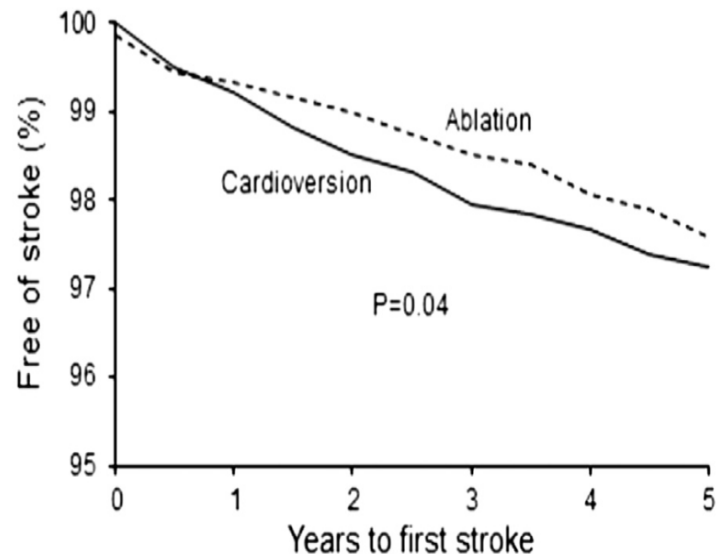
*From the <sup>\*</sup>Heart Rhythm Section, Cardiovascular Diseases, Mayo Clinic, Rochester, Minnesota, <sup>†</sup>Robert D. and Patricia E. Kern Center for Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, and <sup>‡</sup>Optum Labs, Cambridge, Massachusetts.*

- 💧 Retrospektif
- 💧 AF ablasyonu yapılan 12122 hasta
- 💧 Kardiyoversiyon yapılan 12122 hasta



No. at risk	0	1	2	3	4	5
Ablation	12,122	9,340	5,725	3,481	2,102	1,283
Cardioversion	12,122	9,072	5,416	3,219	1,970	1,154

**Figure 1** Unadjusted survival free from stroke or TIA after ablation or cardioversion. TIA = transient ischemic attack.



No. at risk	0	1	2	3	4	5
Ablation	12,122	9,373	5,759	3,508	2,122	1,277
Cardioversion	12,122	9,095	5,432	3,231	1,985	1,163

**Figure 2** Unadjusted survival free from stroke (excluding transient ischemic attack) after ablation or cardioversion.

**Table 3** Periprocedural neurologic events (within 30 d of ablation)

	Ablation cohort (n = 12,122)	Cardioversion cohort (n = 12,122)	Entire cohort (N = 24,244)	P
<b>Primary end points</b>				
Stroke/TIA	55 (0.5)	36 (0.3)	91 (0.4)	.04
Stroke (excluding TIA)	34 (0.3)	27 (0.2)	61 (0.3)	.37
<b>Secondary end points</b>				
Ischemic stroke	33 (0.3)	22 (0.2)	55 (0.2)	.14
Hemorrhagic stroke	1 (0.01)	5 (0.04)	6 (0.02)	.10
TIA	21 (0.17)	9 (0.07)	30 (0.12)	.03

Values are presented as n (%).  
TIA = transient ischemic attack.

# Catheter ablation of atrial fibrillation is associated with reduced risk of stroke and mortality: A propensity score–matched analysis

Walid Saliba, MD, MPH,<sup>\*†</sup> Jorge E. Schliamser, MD,<sup>‡</sup> Idit Lavi, MPH,<sup>\*§</sup>  
Ofra Barnett-Griness, PhD,<sup>\*§</sup> Naomi Gronich, MD,<sup>\*†</sup> Gad Rennert, MD, PhD<sup>\*†||</sup>

*From the \*Department of Community Medicine and Epidemiology, Lady Davis Carmel Medical Center, Clalit Health Services, Haifa, Israel, †Ruth and Bruce Rappaport Faculty of Medicine, Technion – Israel Institute of Technology, Haifa, Israel, ‡Department of Cardiovascular Medicine, Lady Davis Carmel Medical Center, Clalit Health Services, Haifa, Israel, §Statistical Unit, Lady Davis Carmel Medical Center, Clalit Health Services, Haifa, Israel, and ||Department of Epidemiology and Disease Prevention, Office of the Chief Physician, Clalit Health Services Headquarters, Tel Aviv, Israel.*

- ◆ Retrospektif
- ◆ AF ablasyonu yapılan 969 hasta
- ◆ AF ablasyonu yapılmayan (medikal tedavi ile takip edilen) 3772 hasta




**Table 2** Incidence density rates and crude HRs for the association between catheter ablation for atrial fibrillation and primary and secondary outcomes in the propensity score–matched groups (n = 4741)

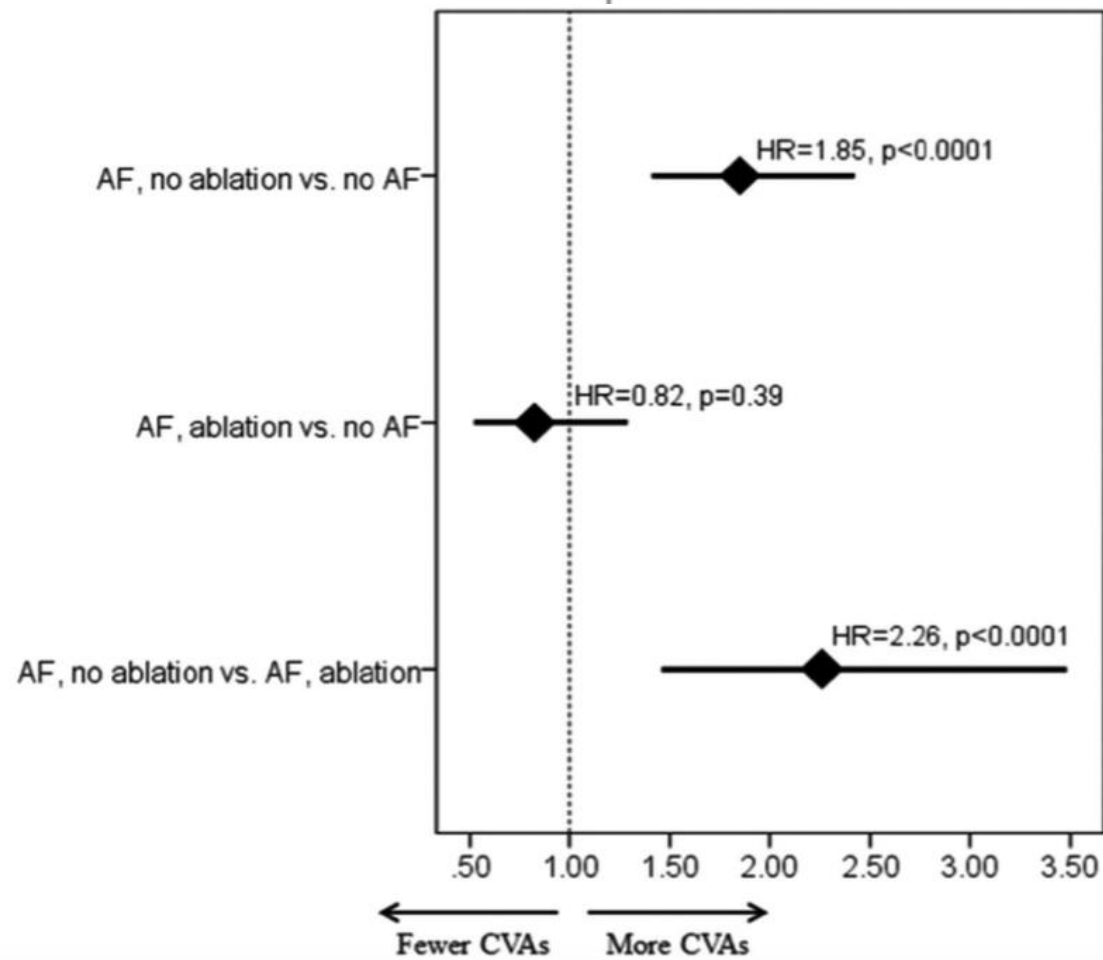
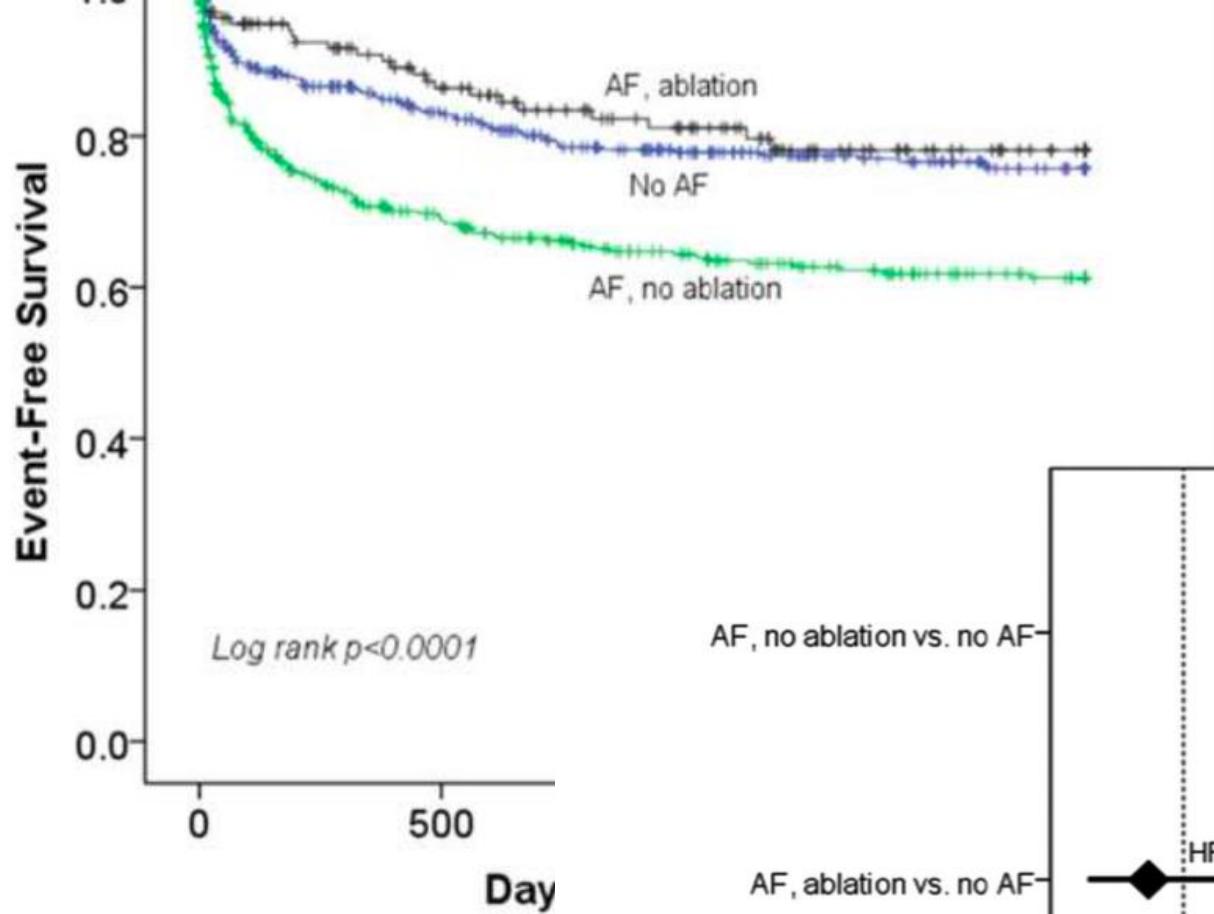
Study outcome	Study group	No. of events	Follow-up duration (person-years)	Incidence rate (95% CI) (per 100 person-years)	Crude HR (95% CI)	P
<b>Primary outcome</b>						
Stroke/TIA	Nonablation	478	14,656	3.26 (2.98–3.56)	Reference	<.001
	Ablation	89	4,237	2.10 (1.70–2.57)	0.61 (0.48–0.79)	
<b>Secondary outcome</b>						
Stroke	Nonablation	382	14,943	2.56 (2.31–2.82)	Reference	.002
	Ablation	74	4,288	1.73 (1.36–2.15)	0.65 (0.50–0.86)	
TIA	Nonablation	153	15,541	0.98 (0.84–1.15)	Reference	.022
	Ablation	24	4,419	0.54 (0.36–0.79)	0.57 (0.35–0.92)	
Mortality	Nonablation	1,160	15,996	7.25 (6.84–7.81)	Reference	<.001
	Ablation	209	4,488	4.66 (4.06–5.32)	0.62 (0.53–0.73)	

CI = confidence interval; HR = hazard ratio; TIA = transient ischemic attack.

# Five-year impact of catheter ablation for atrial fibrillation in patients with a prior history of stroke

T. Jared Bunch MD<sup>1,2</sup>  | Heidi T. May PhD<sup>1</sup> | Tami L. Bair RN<sup>1</sup> |

- ◆ Retrospektif
- ◆ Daha önce SVO geçirmiş ve AF ablasyon yapılan 139 hasta
- ◆ SVO geçiren, AF si olan ancak ablasyon yapılmayan 416 hasta
- ◆ SVO geçiren ve AF'si olmayan 416 hasta



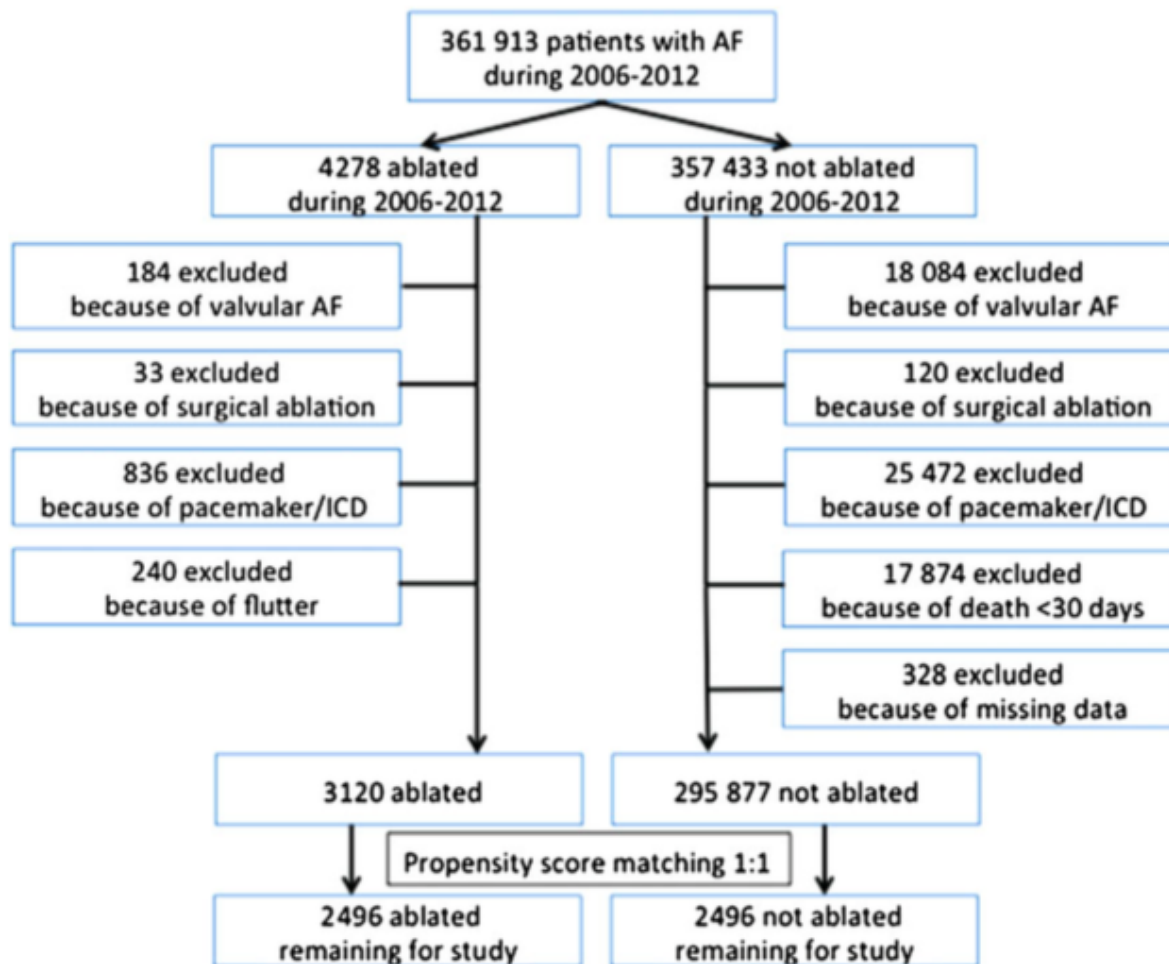
# Catheter ablation for atrial fibrillation is associated with lower incidence of stroke and death: data from Swedish health registries

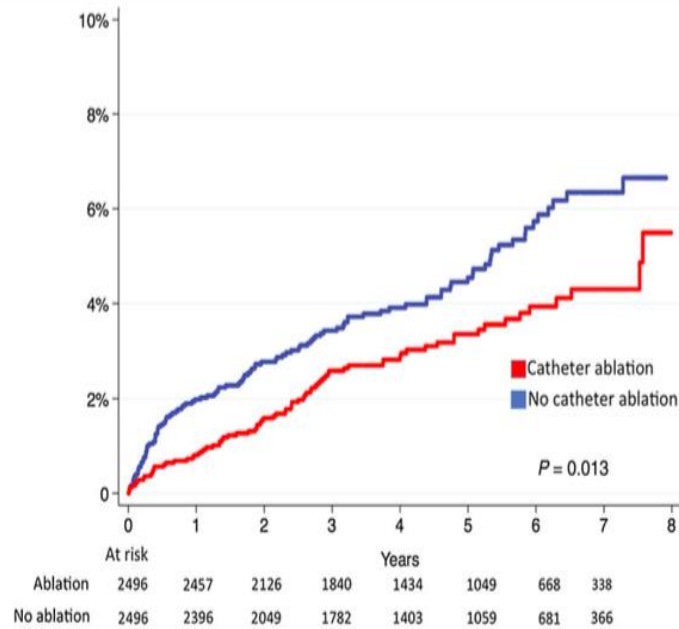
**Leif Friberg<sup>1,2\*</sup>, Fariborz Tabrizi<sup>3,4</sup>, and Anders Englund<sup>3,4</sup>**

<sup>1</sup>Department of Clinical Sciences, Danderyd Hospital, Karolinska Institute, Stockholm, Sweden; <sup>2</sup>Department of Cardiology, Danderyd Hospital, Karolinska Institute, Stockholm, Sweden; <sup>3</sup>Department of Clinical Sciences, South Hospital, Karolinska Institute, Stockholm, Sweden; and <sup>4</sup>Arrhythmia Center Stockholm, Stockholm, Sweden

- ◆ Retrospektif olarak veri kayıtlarının incelenmesi ile yapılan bir çalışma
- ◆ 2496 AF ablasyonu yapılan hasta
- ◆ 2496 Ablasyon yapılmayan hasta
- ◆ Ortalama takip 4.4 + 2.0

Friberg et al. European Heart Journal (2016) 37, 2478–87





**Table 4** Ischaemic stroke, hazard ratios for ablation vs. no ablation

	Propensity score matched ablation vs. no ablation	
	HR (95% CI)	P-value
Univariate	0.69 (0.52–0.92)	0.013
Adjusted for age and sex	0.73 (0.54–0.97)	0.031
+ Adjustment for CHA <sub>2</sub> DS <sub>2</sub> -VASc factors	0.72 (0.54–0.97)	0.030
+ Adjustment for baseline medication	0.69 (0.52–0.93)	0.016
Full adjustment	0.69 (0.51–0.93)	0.016
Full adjustment and stratification for		
New cardioversion ≥ 6 months after index		
No	0.68 (0.48–0.97)	0.035
Yes	1.26 (0.59–2.72)	0.551
Warfarin ≥ 80% of follow-up		
No	0.74 (0.50–1.08)	0.113
Yes	0.61 (0.37–1.00)	0.049
CHA <sub>2</sub> DS <sub>2</sub> -VASc		
0–1 points	0.76 (0.54–1.07)	0.121
≥ 2 points	0.39 (0.19–0.78)	0.008

**Figure 2** Incidence of ischaemic stroke in relation to atrial fibrillation ablation.

	All patients			All propensity score matched			Propensity score matched with OAC ≥ 80% of follow-up			Propensity score matched with OAC < 80% of follow-up		
	Ablation (n = 3120)	No ablation (n = 321 349)	P-value	Ablation (n = 2496)	No ablation (n = 2496)	P-value	Ablation (n = 1044)	No ablation (n = 1340)	P-value	Ablation (n = 1452)	No ablation (n = 1156)	P-value
Ischaemic stroke	83	26 947	<0.001	78	112	0.032	25	50	0.063	53	62	0.036
Annualized stroke rate	0.61% (0.49–0.76%)	2.61% (2.58–2.64%)	<0.001	0.70% (0.55–0.87%)	1.01% (0.83–1.22%)	0.013	0.55% (0.37–0.82%)	0.88% (0.67–1.16%)	0.056	0.80% (0.61–1.05%)	1.15% (0.90–1.48%)	0.050
Cardiovascular death	63	69 444	<0.001	59	128	<0.001	31	64	0.025	25	59	<0.001
Annualized cardiovascular mortality	0.46% (0.36–0.58%)	6.39% (6.34–6.43%)	<0.001	0.49% (0.37–0.64%)	1.08% (0.90–1.29%)	<0.001	0.68% (0.46–0.96%)	1.10% (0.85–1.41%)	0.024	0.37% (0.24–0.54%)	1.07% (0.81–1.37%)	<0.001
Death from any cause	94	97 404	<0.001	88	184	<0.001	47	103	0.001	41	81	<0.001
Annualized all-cause mortality	0.68% (0.56–0.83%)	8.96% (8.90–9.01%)	<0.001	0.77% (0.62–0.95%)	1.62% (1.40–1.87%)	<0.001	1.03% (0.77–1.36%)	1.77% (1.46–2.15%)	0.001	0.60% (0.44–0.82%)	1.46% (1.18–1.82%)	<0.0001

# Successful catheter ablation reduces the risk of cardiovascular events in atrial fibrillation patients with CHA<sub>2</sub>DS<sub>2</sub>-VASc risk score of 1 and higher

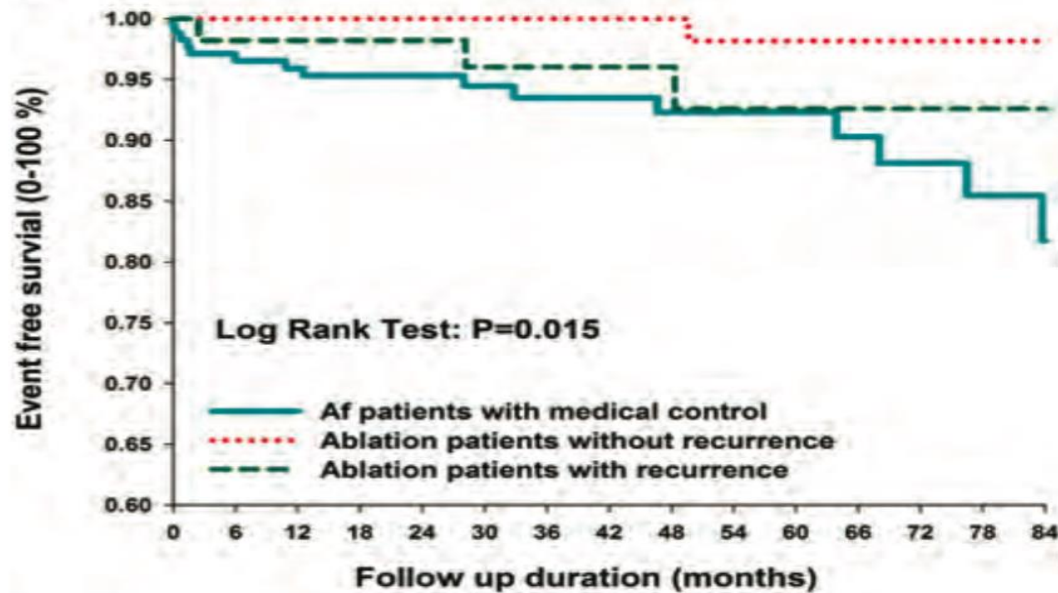
Yenn-Jiang Lin<sup>1,2</sup>, Tze-Fan Chao<sup>1,2</sup>, Hsuan-Ming Tsao<sup>3</sup>, Shih-Lin Chang<sup>1,2</sup>, Li-Wei Lo<sup>1,2</sup>, Chern-En Chiang<sup>1,2</sup>, Yu-Feng Hu<sup>1,2</sup>, Pai-Feng Hsu<sup>4,5</sup>, Shao-Yuan Chuang<sup>6</sup>, Cheng-Hung Li<sup>1,2</sup>, Fa-Po Chung<sup>1</sup>, Yun-Yu Chen<sup>1,7</sup>, Tsu-Juey Wu<sup>8</sup>, Ming-Hsiung Hsieh<sup>9\*</sup>, and Shih-Ann Chen<sup>1,2\*</sup>

<sup>1</sup>Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital, No. 201, Sec. 2, Shih-Pai Road, Taipei, Taiwan; <sup>2</sup>School of Medicine, Institute of Clinical Medicine, and Cardiovascular Research Center, National Yang-Ming University, Taipei, Taiwan; <sup>3</sup>Division of Cardiology, Department of Medicine, National Yang-Ming University Hospital, Taipei, Taiwan; <sup>4</sup>Institute of Public Health, National Yang-Ming University, Taipei, Taiwan; <sup>5</sup>Healthcare Center, Taipei Veterans General Hospital, Taipei, Taiwan; <sup>6</sup>National Health Research Institutes, Miaoli, Taiwan; <sup>7</sup>Institute of Epidemiology and Preventive Medicine College of Public Health, National Taiwan University, 5F1, No. 17, Hsu Chow Road, Taipei, Taiwan; <sup>8</sup>Division of Cardiology, Department of Medicine, Taichung Veterans General Hospital, Taiwan; and <sup>9</sup>Division of Cardiology, Department of Medicine, Wan-Fang Hospital, Taipei Medical University, No 111, Section 3, Hsin-Lung Road, Wenshan Dist., Taipei, Taiwan

- Retrospektif, verilerin incelenmesi ile yapılmış
- CHA<sub>2</sub>DS<sub>2</sub>-VASc score  $\geq 1$  üzerin olan hastalar dahil edilmiş
- AF ablasyonu yapılan 383 hasta
- Medikal tedavi verilen 570 hasta
- Ortalama takip 47 + 23 ay

B

## Stroke / TIA



	Patients with medical treatment (N = 174)	Patients with catheter ablation (N = 174)	P value	Ablation patients		P value
				Without recurrence (N = 118)	With recurrence (N = 56)	
<b>Mortality</b>						
Cardiovascular death	12 (6.9%)	0 (0.0%)*	0.001	0 (0.0%)*	0 (0.0%)*	0.001
Non-cardiovascular death	8 (4.6%)	5 (2.9%)	0.57	2 (1.7%)	3 (5.4%)	0.33
Total mortality	20 (11.5%)	5 (2.9%)*	<0.01	2 (1.7%)*	3 (5.4%)*	<0.01
<b>Vascular events</b>						
TIA/ischaeamic stroke	15 (8.6%)	4 (2.3%)*	0.02	1 (0.8%)*	3 (5.4%)*	0.02
Coronary events	2 (1.1%)	1 (0.6%)	>0.99	1 (0.8%)	0 (0.0%)	>0.99
Pulmonary embolism	1 (0.6%)	0 (0.0%)	>0.99	0 (0.0%)	0 (0.0%)	>0.99
Peripheral arterial events	2 (1.1%)	0 (0.0%)	0.50	0 (0.0%)	0 (0.0%)	0.66
Deep vein thrombosis	1 (0.6%)	0 (0.0%)	>0.99	0 (0.0%)	0 (0.0%)	>0.99
Vascular events except TIA/ ischaemic stroke	6 (3.4%)	1 (0.6%)	0.12	1 (0.8%)	0 (0.0%)	0.19
Total vascular events	21 (12.1%)	5 (2.9%)*	<0.01	2 (1.7%)*	3 (5.4%)*	<0.01



# Catheter ablation of atrial fibrillation in patients with heart failure: impact of maintaining sinus rhythm on heart failure status and long-term rates of stroke and death

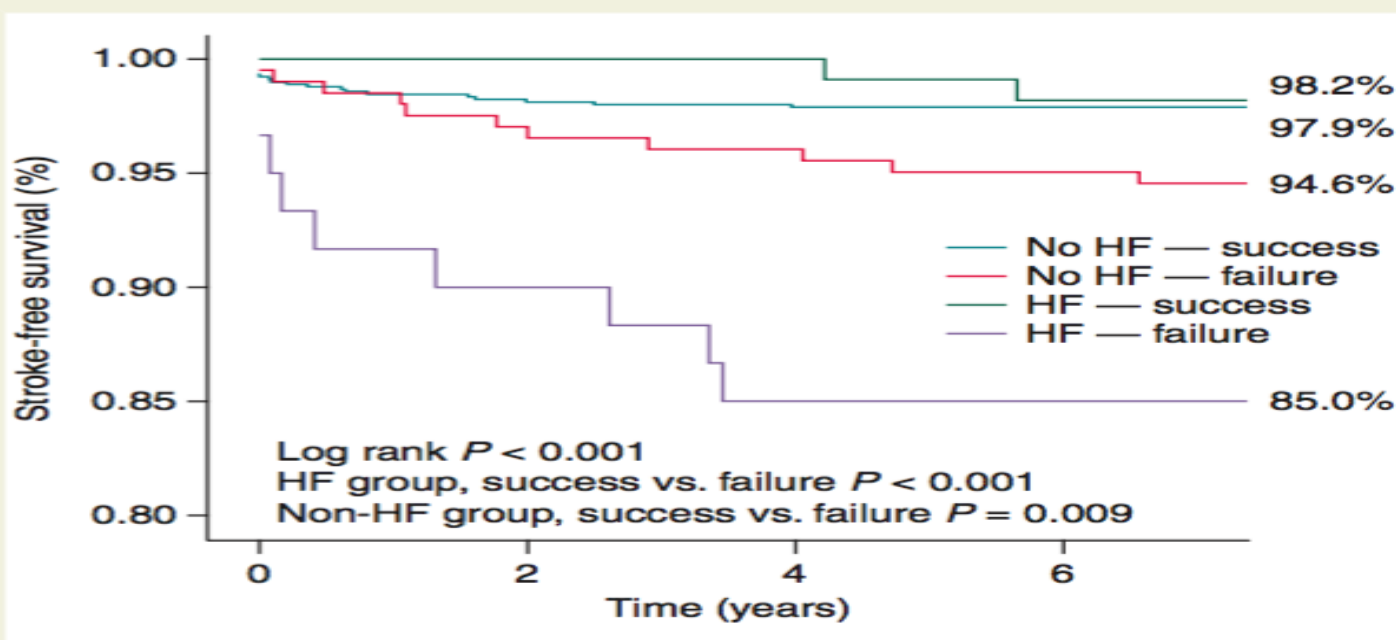
**Waqas Ullah<sup>1†</sup>, Liang-Han Ling<sup>1,2†</sup>, Sandeep Prabhu<sup>2</sup>, Geoffrey Lee<sup>2</sup>, Peter Kistler<sup>2</sup>, Malcolm C. Finlay<sup>1</sup>, Mark J. Earley<sup>1,3</sup>, Simon Sporton<sup>1,3</sup>, Yaver Bashir<sup>4</sup>, Tim R. Betts<sup>4</sup>, Kim Rajappan<sup>4</sup>, Glyn Thomas<sup>5</sup>, Edward Duncan<sup>5</sup>, Andrew Staniforth<sup>6</sup>, Ian Mann<sup>1</sup>, Anthony Chow<sup>1</sup>, Pier Lambiase<sup>1</sup>, Richard J. Schilling<sup>1,3</sup>, and Ross J. Hunter<sup>1,3\*</sup>**

<sup>1</sup>Department of Arrhythmia Services, The Barts Heart Centre, St Bartholomew's Hospital, Barts Health NHS Trust, London, UK; <sup>2</sup>The University of Melbourne and the Baker Heart Research Institute, Melbourne, Australia; <sup>3</sup>The London AF centre, London Bridge Hospital, London, UK; <sup>4</sup>Oxford University Hospitals NHS Trust John Radcliffe Hospital, Oxford, UK; <sup>5</sup>Bristol Heart Institute, Bristol, UK; and <sup>6</sup>NUH Hospitals Trust, Nottingham, UK

- 💧 Kalp yetmezliđi olup AF ablasyonu yapılan 171 hasta
- 💧 Kalp yetmezliđi olmayan AF ablasyonu yapılan 1102 hasta
- 💧 Ortalama takip 3.1 yıl

**Table 3** Rates of stroke and death in patients with or without HF

	HF	No HF	P-value
Stroke	4 (2.3%)	16 (1.5%)	0.331
Death	7 (4.1%)	16 (1.5%)	0.026
Death cardiovascular	6 (3.5%)	10 (0.9%)	0.014



**Figure 3** Impact of recurrent AF and HF on rate of stroke and death. The Kaplan–Meier curve shows freedom from the combined endpoint of stroke or death. The population is divided based on whether they had HF at baseline and whether they had recurrent arrhythmia at follow-up.

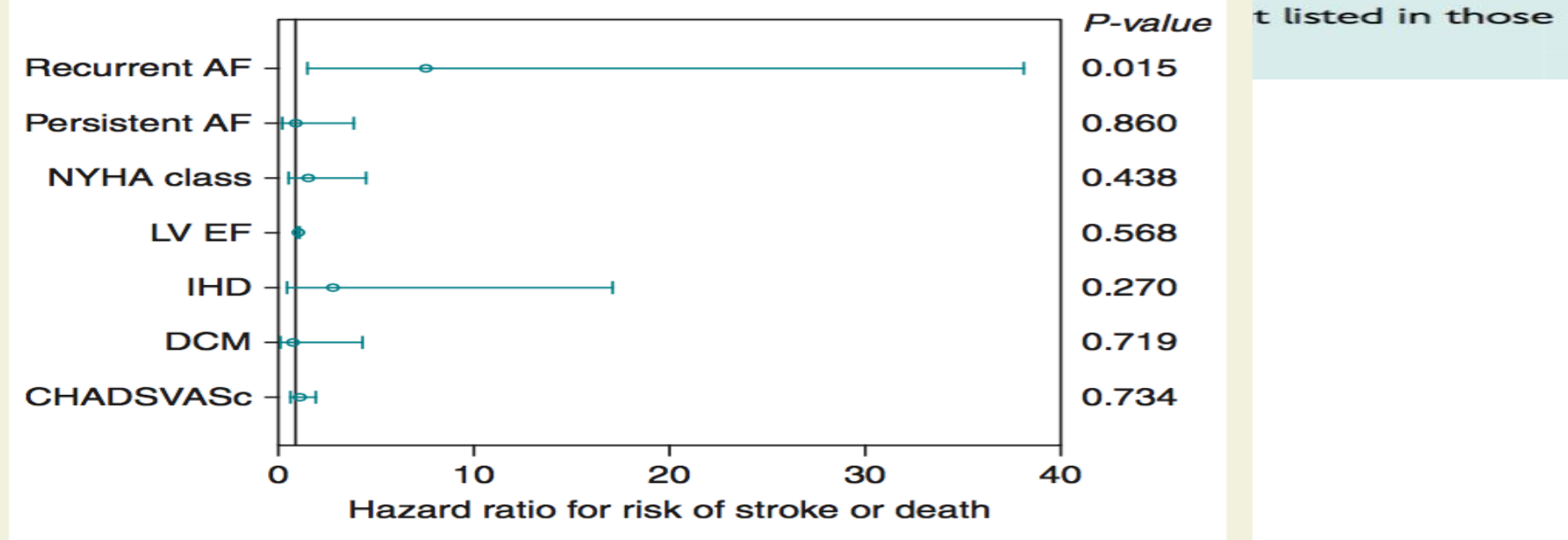
The raw causes in

178

lar

**Table 4** The impact of recurrent arrhythmia on the risk of adverse events in HF and non-HF populations

	HF	Non-HF
Stroke or death	8.33 (1.86–37.30) <i>P</i> = 0.001	2.58 (1.25–5.34) <i>P</i> = 0.008
Death	11.10 (1.37–90.06) <i>P</i> = 0.004	5.73 (2.16–15.2) <i>P</i> < 0.001
Cardiac death	9.25 (1.106–77.37) <i>P</i> = 0.012	2.97 (0.846–10.429) <i>P</i> = 0.075
Stroke	5.55 (0.59–52.20) <i>P</i> = 0.091	1.028 (0.296–3.575) <i>P</i> = 0.965



**Figure 4** Factors predicting stroke and death during long-term follow-up. Multivariate analysis of factors predicting stroke or death during follow-up. The figure shows HR and 95% CIs.

Çalışma	Hasta sayısı	Kadın cinsiyet (%)	Yaş	PAF	CHADS <sub>2</sub> ≥2 (%)
Oral ve ark. (2006)	755	23.5	55±11	65	18
Themistoclakis ve ark. (2010)	3355	23	57±11	60	18
Yagishita ve ark. (2011)	524	19	60±10	69	16
Saad ve ark. (2011)	327	20.8	63±13	60	71
Hussein ve ark. (2011)	831	22.5	59±10	69	24
Lin ve ark. (2012)	348	47.1	57±10	81	Ort. 1.1±0.88

Çalışma	OAK sonrası tedavi	Takip süresi (ay)	Takipte AOK stoplanması (%)	OAK kesilince olay hızı (%)	OAK altında olay hızı (%)
Oral ve ark. (2006)	ASA	25±8	53	0	0.3
Themistoclakis ve ark. (2010)	ASA	28±13	80	0.03	0.23
Yagishita ve ark. (2011)	Veri yok	44±13	82	0	0.9
Saad ve ark. (2011)	ASA veya klop.	46±17	90	2.2	Veri yok
Hussein ve ark. (2011)	Veri yok	55 (12-58)	66	0.06	Veri yok
Lin ve ark. (2012)	ASA	47±13	97.7	0.59	Veri yok

**Table 1**  
**Incidence of MRI-detected silent cerebral ischemia according to ablation technique**

Author, Year	N	Activated Clotting Time (s)	Ablation Technique	Silent Cerebral Ischemia (%)
Lickfett et al, <sup>62</sup> 2006	10	>250	Irrigated-tip RFA	10
Schwarz et al, <sup>19</sup> 2010	21	>300	Irrigated-tip RFA	14
Gaita et al, <sup>13</sup> 2010	232	250–300	Irrigated-tip RFA <sup>c,d</sup>	14
Schrackel et al, <sup>14</sup> 2010	53	>250	Irrigated-tip RFA	11
Herrera Siklody et al, <sup>16</sup> 2011	27	>300	RFA	33
	23	—	Irrigated-tip RFA	7.4
	24	—	Cryoablation	4.3
Neumann et al, <sup>55</sup> 2011	44	>300	Irrigated-tip RFA <sup>d</sup>	6.8
	45	—	Cryoablation	8.9
Deneke et al, <sup>20</sup> 2011	86	>300	Irrigated-tip RFA	38
Gaita et al, <sup>15</sup> 2011	36	>300	RFA	39
	36	—	Irrigated-tip RFA	8.3
	36	—	Cryoablation	5.6
Scaglione et al, <sup>63</sup> 2012	80	>300	Irrigated-tip RFA	6.0
Ichiki et al, <sup>54</sup> 2012	100	>250 <sup>a</sup>	Irrigated-tip RFA <sup>c</sup>	7.0
Martinek et al, <sup>21</sup> 2013	131	>300 <sup>a</sup>	Irrigated-tip RFA	12
Schmidt et al, <sup>57</sup> 2013	99	>250 <sup>a</sup>	Irrigated-tip RFA	22
Ichiki et al, <sup>54</sup> 2012	210	>250 <sup>a</sup>	Irrigated-tip RFA <sup>c</sup>	12
Haeusler et al, <sup>17</sup> 2013	37	>300	Irrigated-tip RFA	41
Wieczorek et al, <sup>64</sup> 2013	37	>300 <sup>a</sup>	Irrigated-tip RFA	27
Verma et al, <sup>58</sup> 2013	60	>350 <sup>a</sup>	Irrigated-tip RFA	1.7
Di Biase et al, <sup>61</sup> 2014	146	>300 <sup>b</sup>	Irrigated-tip RFA	2.0

Abbreviations: PVI, pulmonary vein isolation; RFA, radiofrequency ablation.

<sup>a</sup> Uninterrupted anticoagulation.

<sup>b</sup> Uninterrupted anticoagulation and heparin bolus prior to transeptal puncture. All studies aimed for PVI only unless otherwise indicated.

<sup>c</sup> Complex fractionated atrial electrocardiogram ablation in addition to PVI.

<sup>d</sup> Lines in addition to PVI.



Statistics are like mini-skirts, shows a lot of things

but does not show what is essentially

*(Sir Alex Ferguson)*



