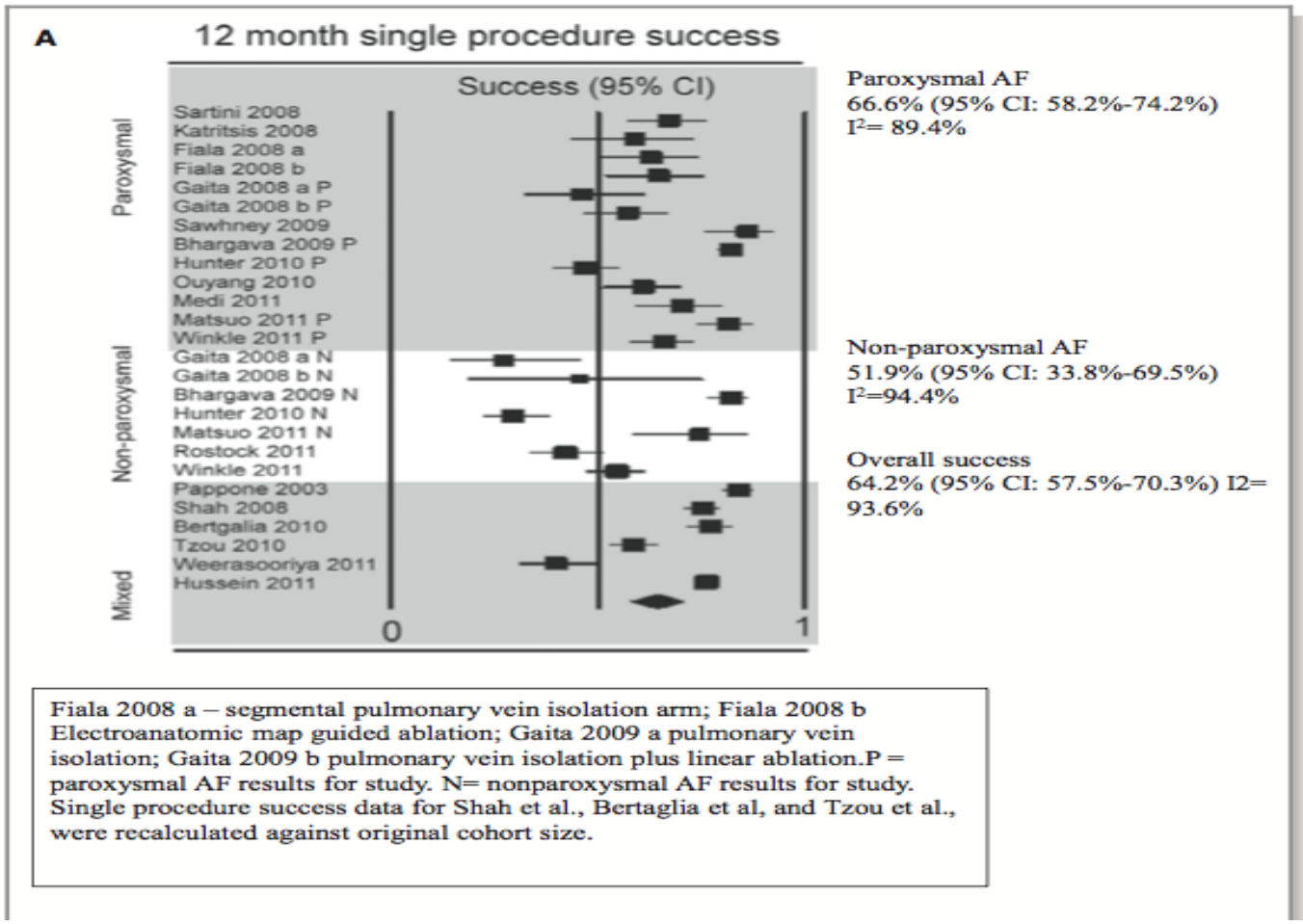
CARTO ile AF ablasyonu sonrası rekürrense yaklaşım

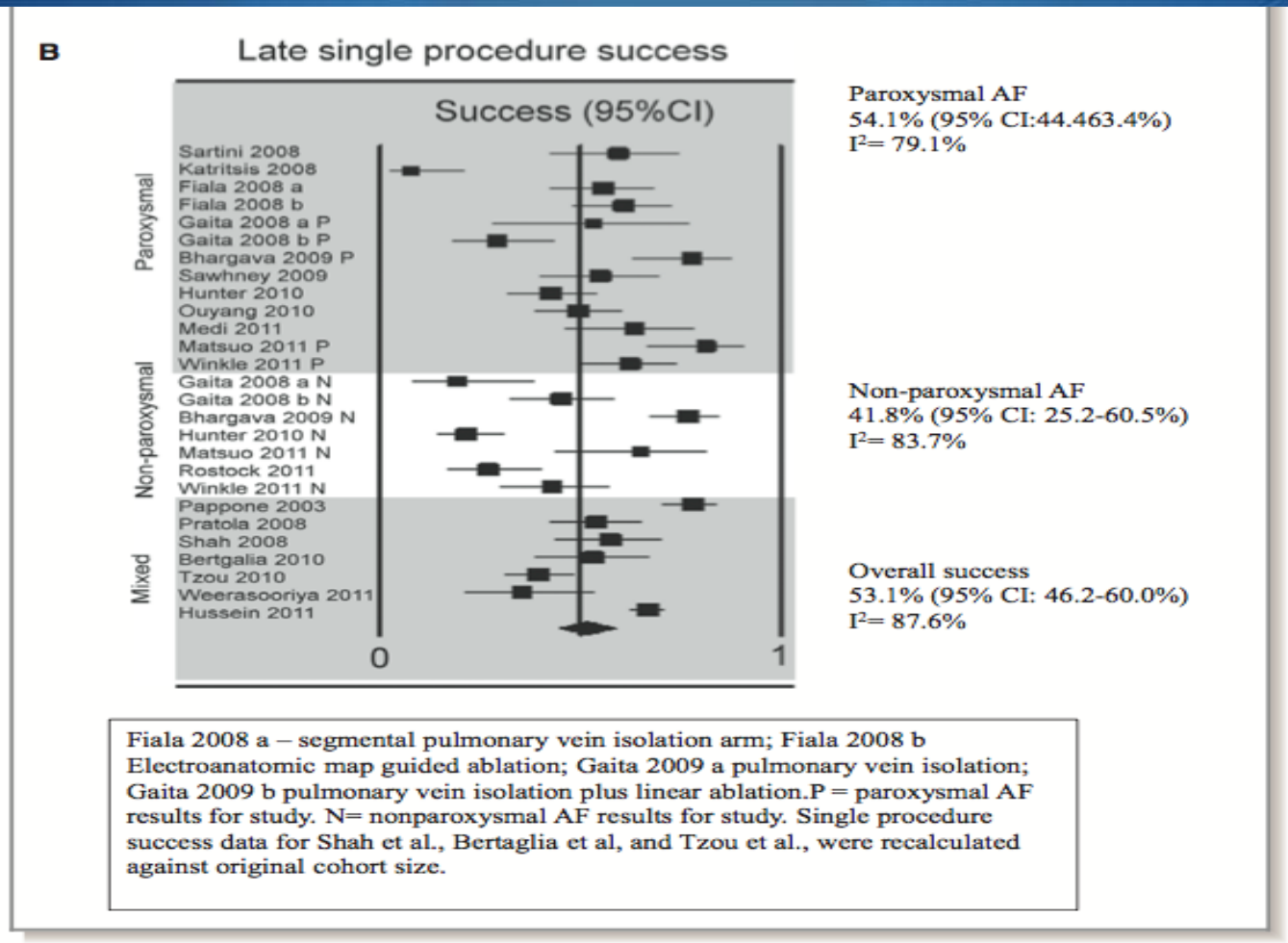
Dr. Mustafa Yılmaz

12- Şubat-2016, Antalya



Fiala 2008 a – segmental pulmonary vein isolation arm; Fiala 2008 b Electroanatomic map guided ablation; Gaita 2009 a pulmonary vein isolation; Gaita 2009 b pulmonary vein isolation plus linear ablation.P = paroxysmal AF results for study. N= nonparoxysmal AF results for study. Single procedure success data for Shah et al., Bertaglia et al, and Tzou et al., were recalculated against original cohort size.

Ganesan et al. J Am Heart Assoc. 2013;2:e004549



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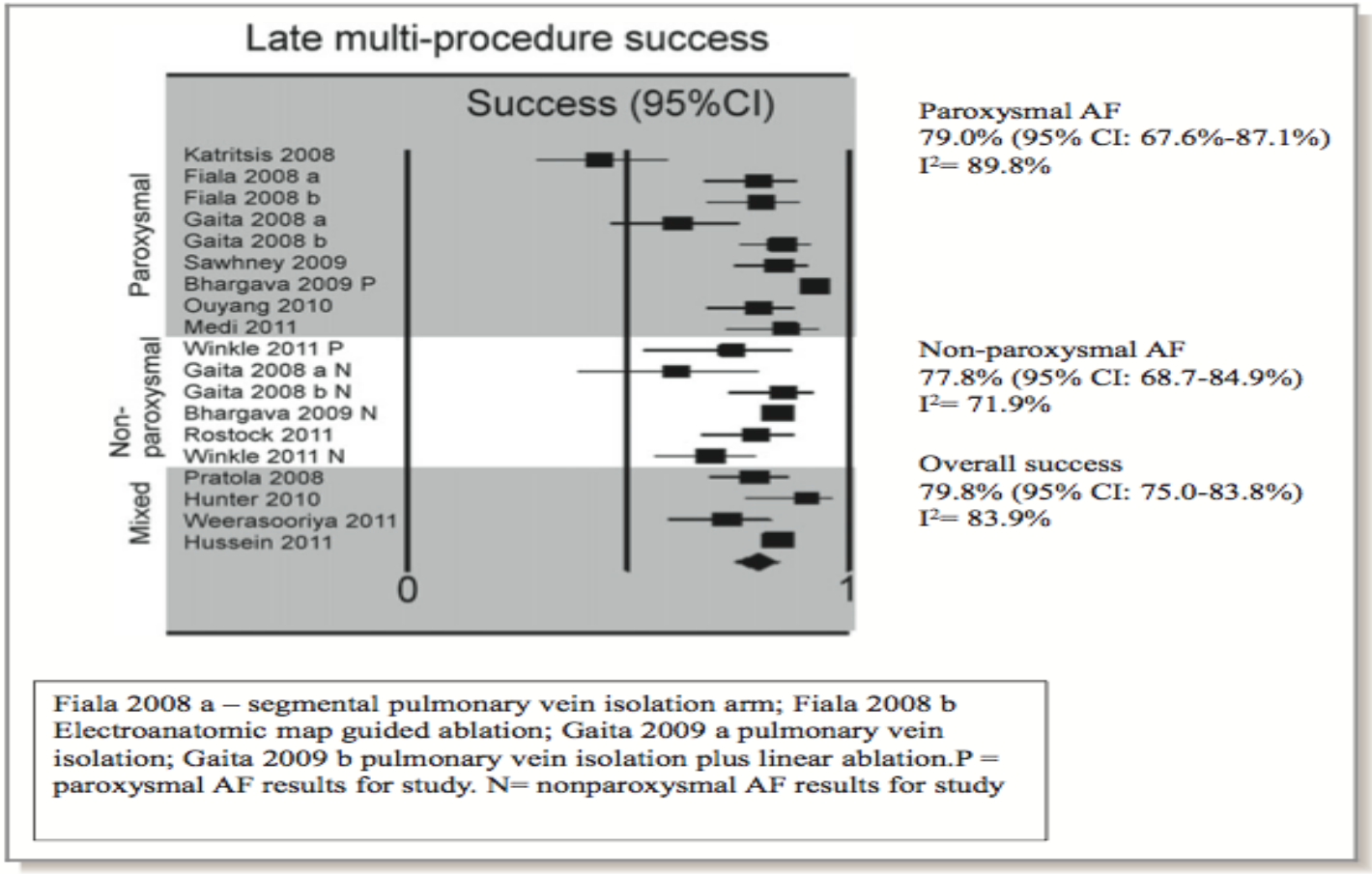
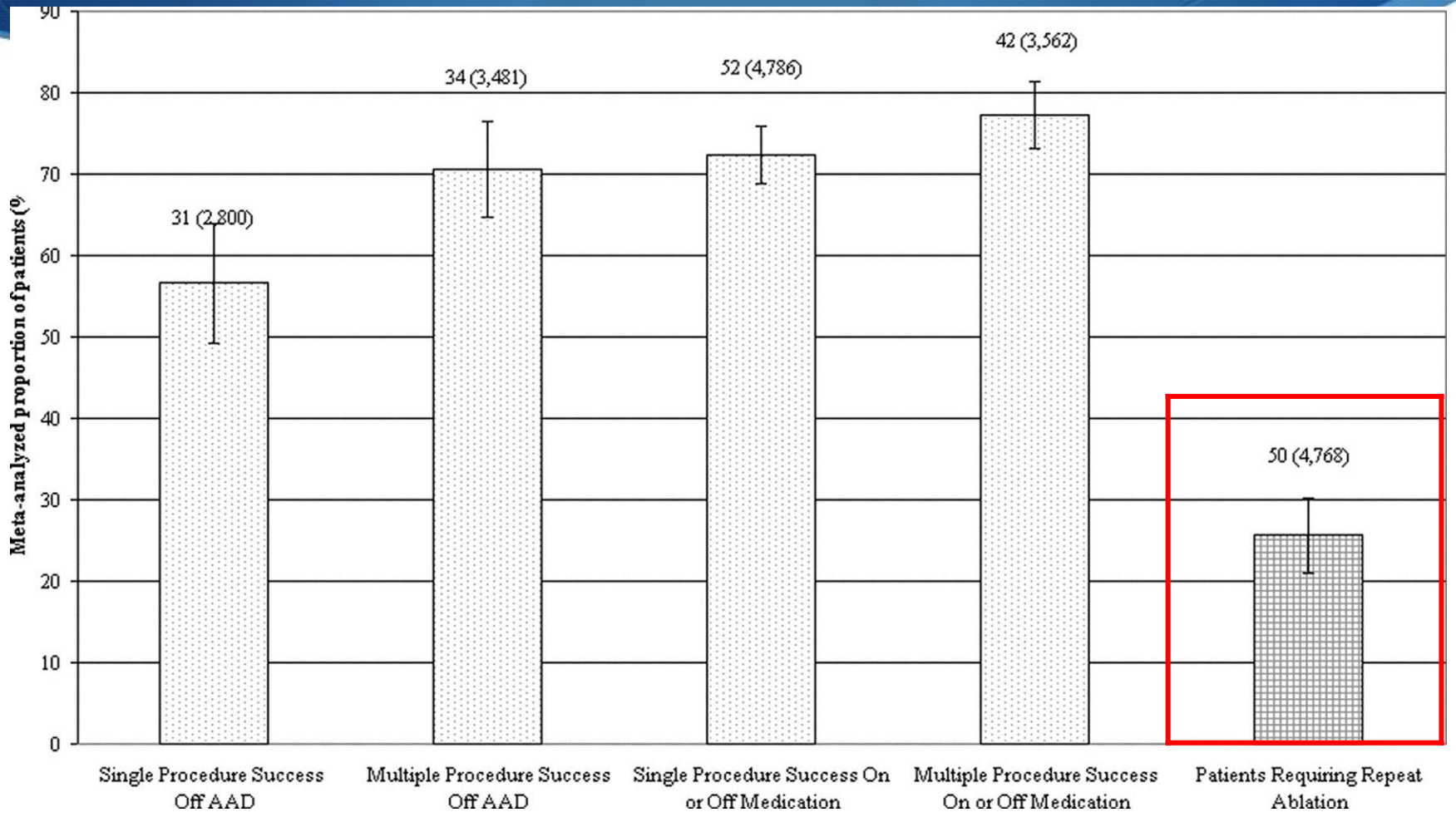
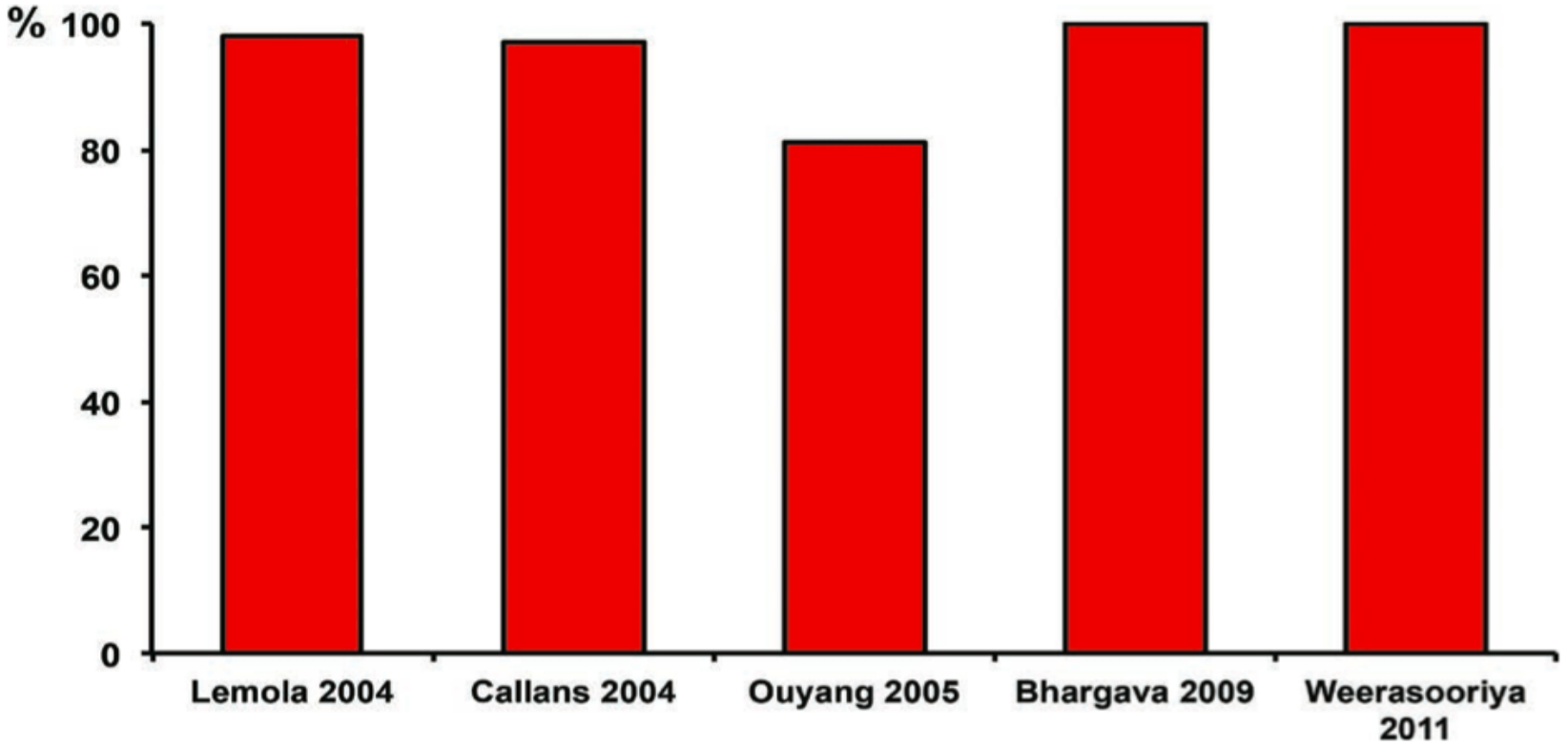


Ganesan et al. J Am Heart Assoc. 2013;2:e004549

AF'li hastalarda kateter ablasyonun etkisi



Hugh Calkins et al. Circ Arrhythm Electrophysiol. 2009;2:349-361



Prevalence of pulmonary vein reconnection in patients undergoing repeat catheter ablation procedures.

Santangeli P et al. Methodist Debakey Cardiovasc J. 2015 Apr-Jun;11(2):71-5.

- AF nedeni ile ablasyon yapılan hastaların yaklaşık %25'inde redo ablasyon gerekir.
- Nüks olan olguların büyük çoğunluğunda PV rekonneksiyonu görülür.

RF ile ablasyon sonrası nükse yaklaşım ne olmalıdır ?

- Re-ablasyon mu? Antiaritmik ilaç mı?
- Re-ablasyon yapılacak ise
  - Kryoablasyon mu?
  - RF ablasyon mu?
- PV izolasyonuna ek olarak farklı bölgelerin ablasyonunun faydası varmı?

Re-ablasyon mu? Antiaritmik ilaç mı?

Progression of Atrial Fibrillation After a Failed Initial Ablation Procedure in Patients With Paroxysmal Atrial Fibrillation

A Randomized Comparison of Drug Therapy Versus Reablation

Evgeny Pokushalov, MD, PhD; Alexander Romanov, MD; Mirko De Melis, PhD; Sergey Artyomenko, MD; Vera Baranova, MD; Denis Losik, MD; Sevda Bairamova, MD; Alexander Karaskov, MD, PhD; Suneet Mittal, MD; Jonathan S. Steinberg, MD

Background—The aim of this prospective randomized study was to assess whether an early reablation was superior to antiarrhythmic drug (AAD) therapy in patients with previous failed pulmonary vein isolation.

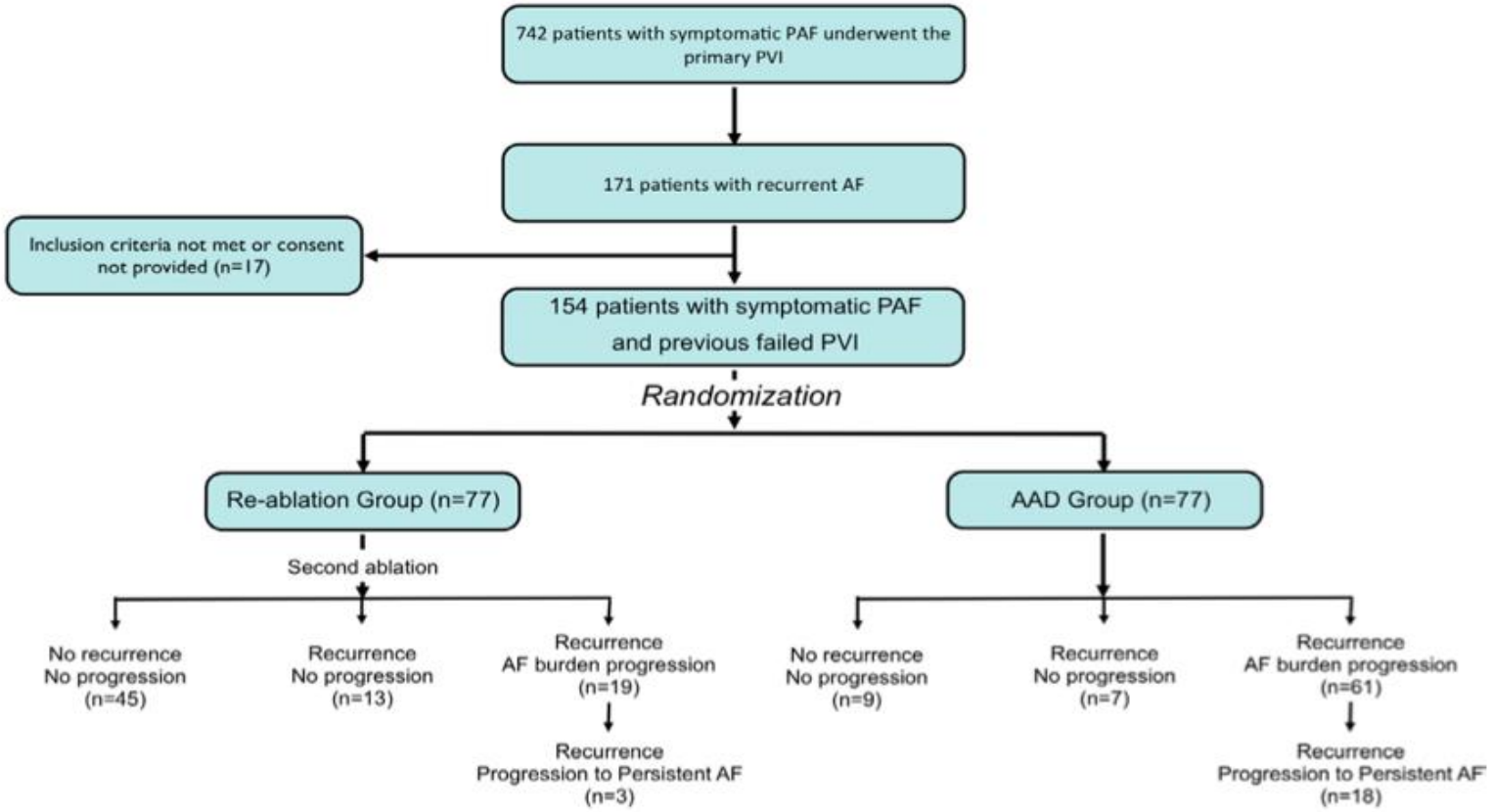
Methods and Results—Patients with paroxysmal atrial fibrillation (AF) eligible for AAD therapy or reablation after a previously failed initial pulmonary vein isolation procedure were eligible for this study and were followed up for 3 years to assess rhythm by means of an implanted cardiac monitor. After the blanking period postablation, 154 patients had symptomatic AF recurrences and were randomized to AAD (n=77) or repulmonary vein isolation (n=77). At the end of follow-up, 61 (79%) patients in the AAD group and 19 (25%) patients in the reablation group demonstrated AF% progression ($P<0.01$). The AF% at 36 months was significantly greater in the AAD group compared with patients in the reablation group (18.8±11.4% versus 5.6±9.5%, respectively; $P<0.01$). In addition, 18 (23%) patients in the AAD group and 3 (4%) patients in the reablation group progressed to persistent AF ($P<0.01$). Furthermore, 45 (58%) of the 77 reablation group patients were free of AF/atrial tachycardia on no AADs; in contrast, in the AAD group, only 9 (12%) of the 77 patients were free of AF/atrial tachycardia ($P<0.01$) throughout follow-up.

Conclusions—Redo AF ablation was substantially more effective than AAD in reducing the progression and prevalence of AF after the failure of an initial ablation.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT01709682.

(*Circ Arrhythm Electrophysiol*. 2013;6:754-760.)

Re-ablasyon mu? Antiaritmik ilaç mı?



Pokushalov et al. Circ Arrhythm Electrophysiol. 2013;6:754-760.

- Bu çalışmada ilk ablasyon işleminde RF ile PV izolasyonu yapılmış
- Re-ablasyon işlemlerinin tamamı CARTO sistemi ile gerçekleştirilmiş
- Re-ablasyon yapılanlarda hedef tekrar PV izolasyonu, flutter olan hastalarda ek olarak lineer ablasyon hattı uygulanmış
- Antiartimik ilaç grubundaki hastalara; propafenon 400-600 mg/gün, flekainid 200-400 mg/gün veya sotalol 160-320 mg/gün verilmiş
- Antiaritmik ilaç grubunda hiç bir hastaya amiodoron verilmemiş
- Kalp yetmezliği, EF<%35, LA>6.0 cm hastalar çalışmaya alınmamış.

Kryoablasyon mu? RF ablasyon mu?

Cryoballoon Versus Radiofrequency for Pulmonary Vein Re-Isolation After a Failed Initial Ablation Procedure in Patients with Paroxysmal Atrial Fibrillation

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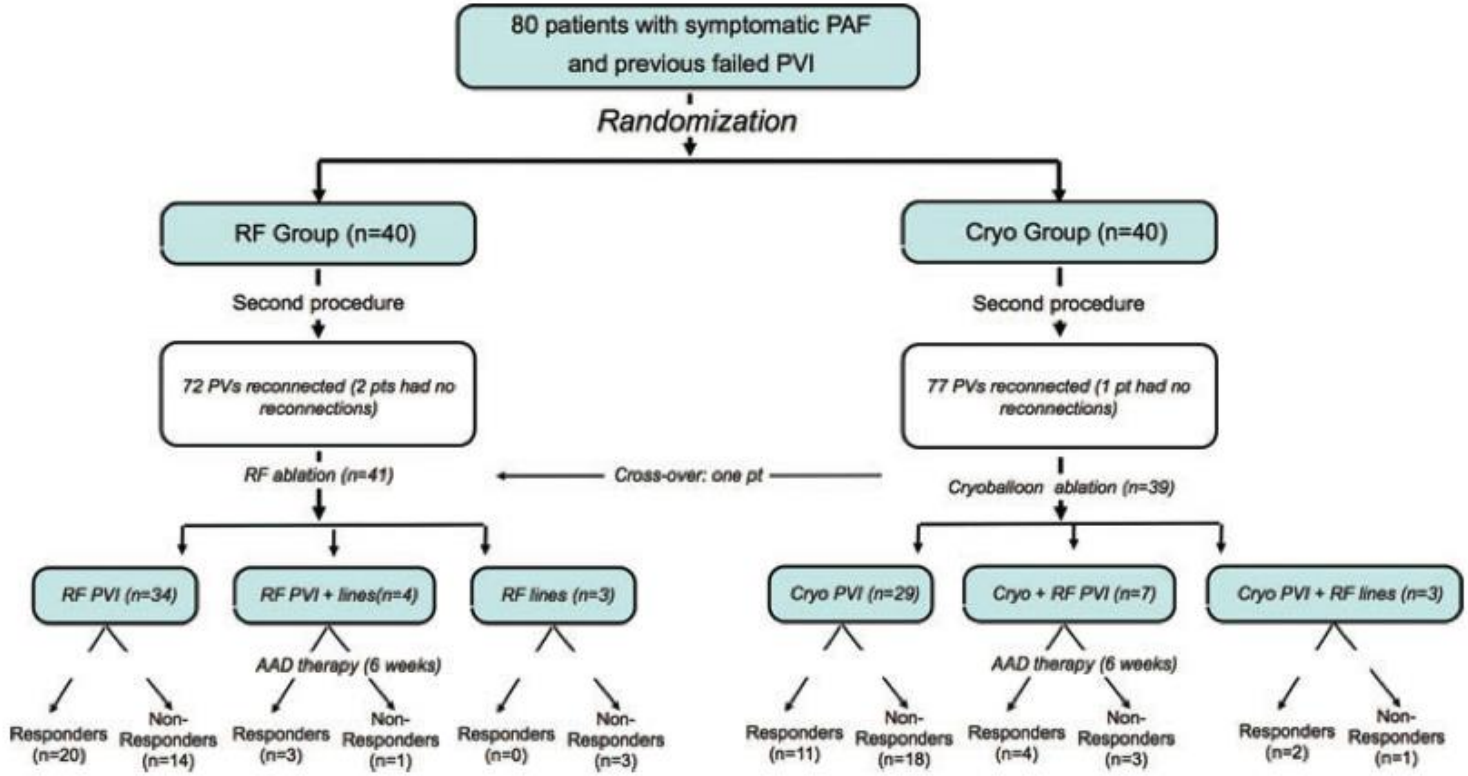
Cryoballoon versus Radiofrequency Ablation. ***Aim:*** **Catheter ablation of paroxysmal atrial fibrillation (PAF) is associated with an important risk of early and late recurrence, necessitating repeat ablation procedures. The aim of this prospective randomized patient-blind study was to compare the efficacy and safety of cryoballoon (Cryo) versus radiofrequency (RF) ablation of PAF after failed initial RF ablation procedure.**

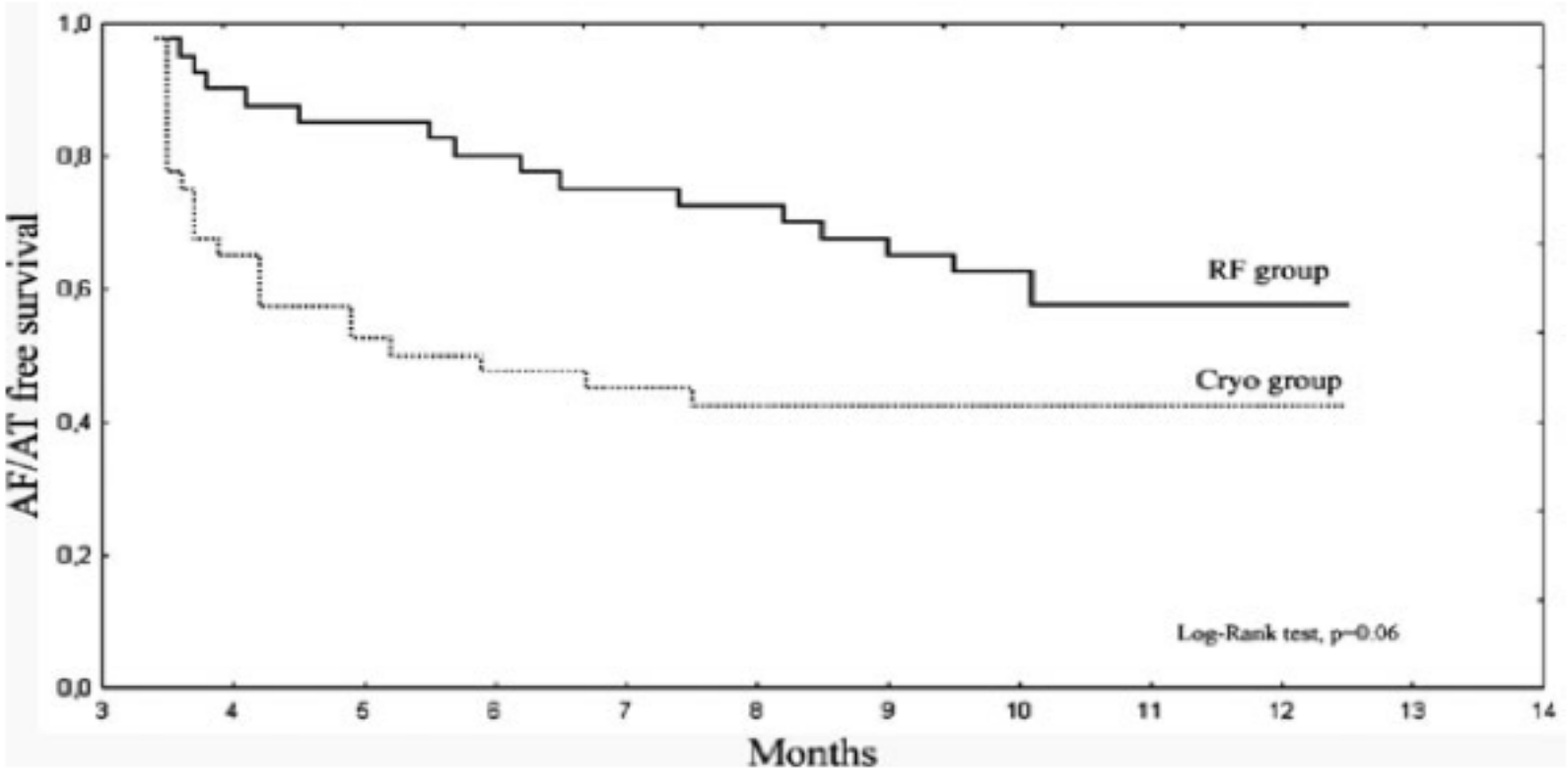
Methods: **Patients with a history of symptomatic PAF after a previous failed first RF ablation procedure were eligible for this study. Patients were randomized to Cryo or RF redo ablation. The primary endpoint of the study was recurrence of atrial tachyarrhythmia, including AF and left atrial flutter/tachycardia, after a second ablation procedure at 1 year of follow-up. All patients were implanted with a cardiac monitor (Reveal XT, Medtronic) to continuously track the cardiac rhythm. Patients with an AF burden (AF%) $\leq$ 0.5% were considered AF-free (Responders), while those with an AF% $>$ 0.5% were classified as patients with AF recurrences (non-Responders).**

Results: **Eighty patients with AF recurrences after a first RF pulmonary vein isolation (PVI) were randomized to Cryo (N = 40) or to RF (N = 40). Electrical potentials were recorded in 77 mapped PVs (1.9 $\pm$ 0.8 per patient) in Cryo Group and 72 PVs (1.7 $\pm$ 0.8 per patient) in RF Group (P = 0.62), all of which were targeted. In Cryo group, 68 (88%) of the 77 PVs were re-isolated using only Cryo technique; the remaining 9 PVs were re-isolated using RF. In RF group, all 72 PVs were successfully re-isolated (P = 0.003 vs Cryo). By intention-to-treat, 23 (58%) RF patients were AF-free vs 17 (43%) Cryo patients on no antiarrhythmic drugs at 1 year (P = 0.06). Three patients had temporary phrenic nerve paralysis in the Cryo group; the RF group had no complications. Of the 29 patients who had only Cryo PVI without any RF ablation, 11 (38%) were AF-free vs 20 (59%) of the 34 patients who had RF only (P = 0.021).**

Conclusion: **When patients require a redo pulmonary vein isolation ablation procedure for recurrent PAF, RF appears to be the preferred energy source relative to Cryo.** *(J Cardiovasc Electrophysiol, Vol. 24, pp. 274-279, March 2013)*

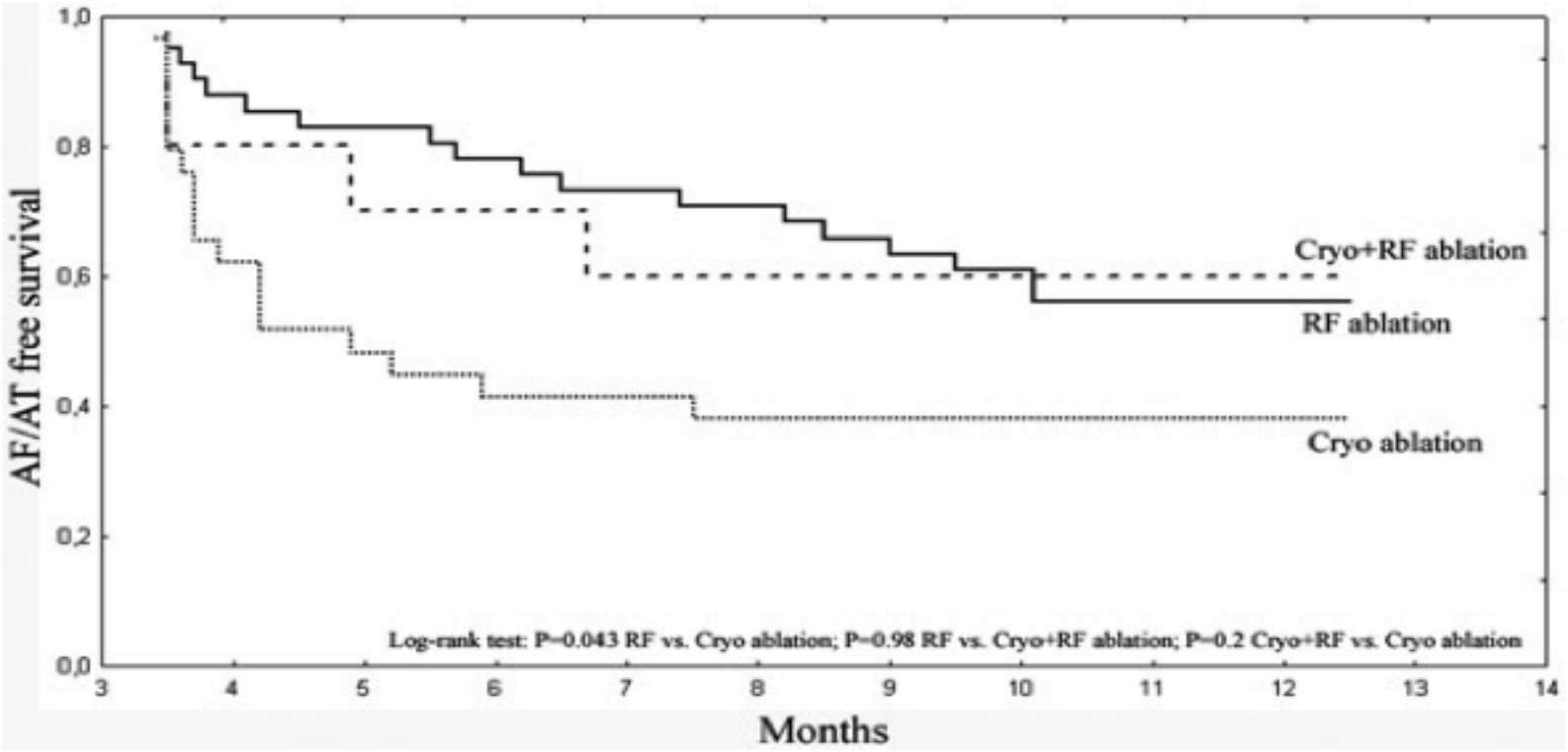


Pokushalov et al. J Cardiovasc Electrophysiol, Vol. 24, pp. 274-279, March 2013)



Incidence of AF recurrences by intention-to-treat at the 12-month follow- up examination.

Pokushalov et al. J Cardiovasc Electrophysiol, Vol. 24, pp. 274-279, March 2013)



Incidence of AF recurrences in regard to on-treatment comparisons at the 12-month follow-up.

Pokushalov et al. J Cardiovasc Electrophysiol, Vol. 24, pp. 274-279, March 2013

- Hastaların tamamı işlemden önce ve 6 hafta sonraya kadar antiartimik ilaç almış
- Antiaritmik ilaç olarak flekainid veya propafenon tercih edilmiş.
- Amiodoron hiç bir hastada kullanılmamış.
- RF ile yapılan re-ablasyon işlemlerinin tamamında CARTO sistemi kullanılmış.
- Kalp yetmezliği, EF<%35 ve LA>6.0 cm çalışma dışında bırakılmış

Recurrence of paroxysmal atrial fibrillation after pulmonary vein isolation: is repeat pulmonary vein isolation enough? A prospective, randomized trial

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Aims In patients with paroxysmal atrial fibrillation (pAF), pulmonary vein isolation (PVI) has become an accepted treatment option with single procedure success rates of 60–80%. A repeat ablation is performed in ~30% of patients because of arrhythmia recurrence. The strategy for this repeat procedure is not defined.

Methods and results Patients with pAF recurrence after PVI were prospectively randomized and underwent a second ablation procedure with either PVI of all reconnected veins or PVI with an additional left atrial anterior line. Follow-up in our arrhythmia clinic was every 3 months up to 12 months including 7 day Holter monitoring. A total of 77 patients (mean age 63 ± 9 years, 69% males) were included in the analysis. A repeat PVI was performed in 41 patients, PVI + anterior line in 36 patients. After a follow-up of 12 months, 26 of 41 (63%) patients after repeat PVI and 18 of 36 (50%) patients with PVI + anterior line were in stable sinus rhythm off antiarrhythmic medication ($P = 0.26$). In most patients (12 of 15 patients with PVI and 14 of 18 patients with PVI + anterior line) with an arrhythmia recurrence after the second procedure, the recurring arrhythmia was paroxysmal AF. In 2 of 15 patients of the PVI group and in 4 of 18 patients of the PVI + anterior line group atypical flutter was the reoccurring arrhythmia (P = NS).

Conclusion In this prospective randomized trial, patients with a recurrence of paroxysmal AF had no better outcome after repeat PVI + one left atrial line compared with patients with repeat PVI only.

Fichtner S et al. Europace. 2015 Sep;17(9):1371-5.

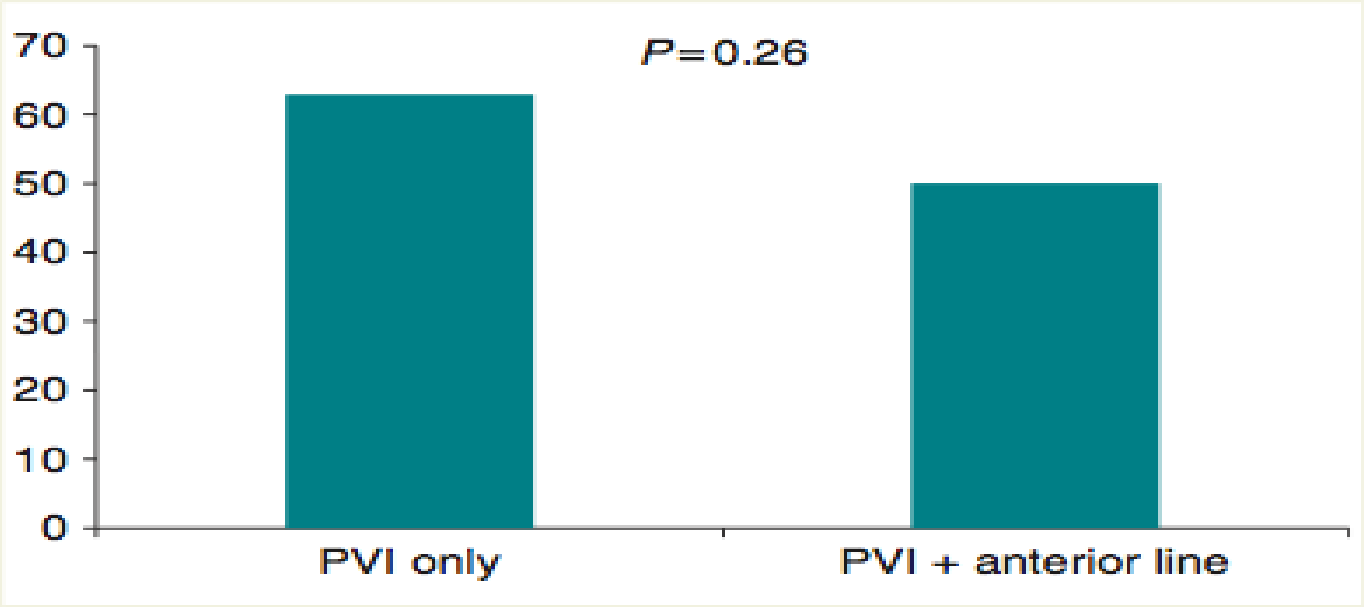

Figure 2 After a follow-up of 12 months 63% in the PVI only group and 50% in the PVI + anterior line group were in stable sinus rhythm off antiarrhythmic medication.

Fichtner S et al. Europace. 2015 Sep;17(9):1371-5.

Predictors and Characteristics of Multiple (More Than 2) Catheter Ablation Procedures for Atrial Fibrillation

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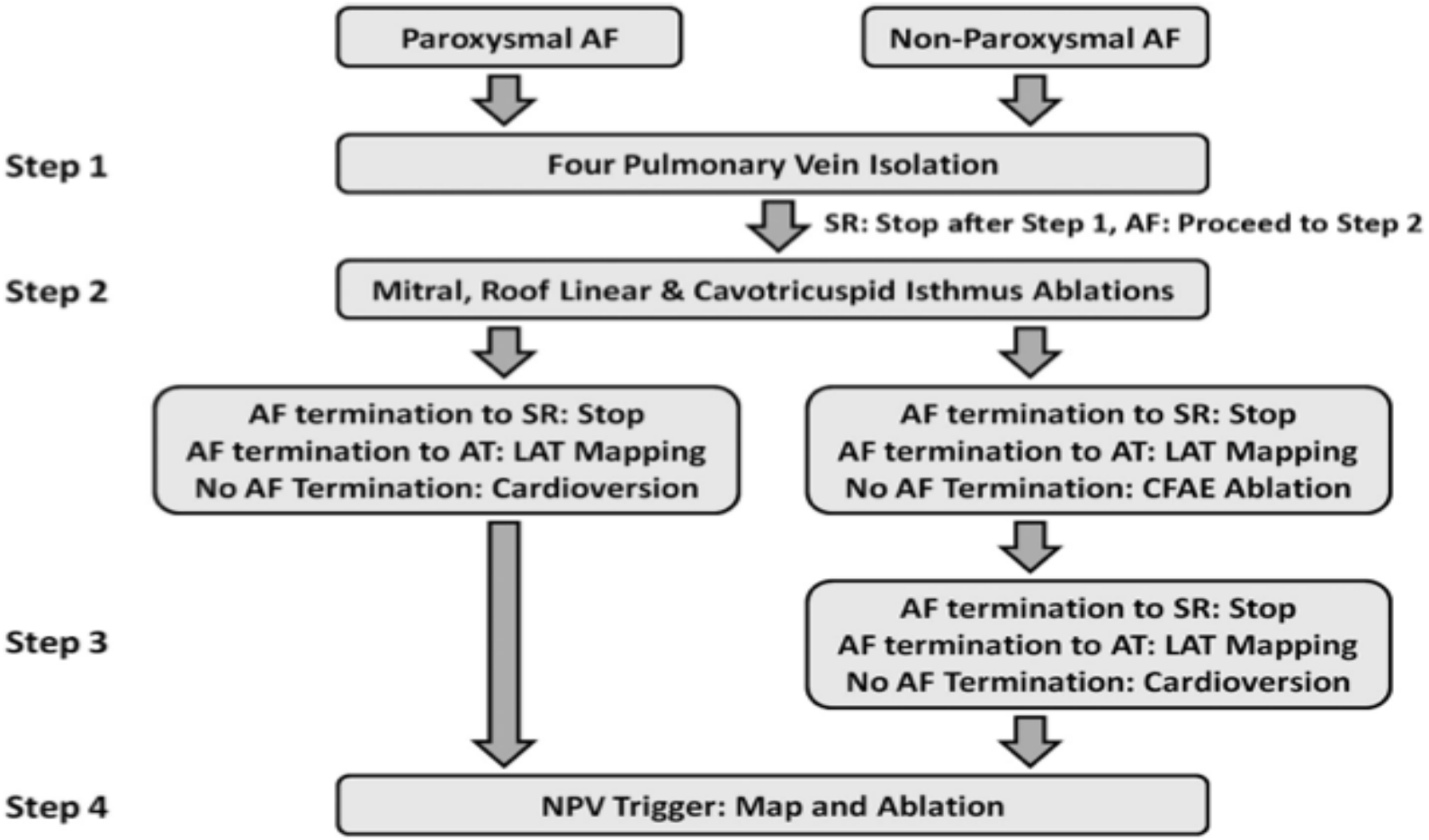
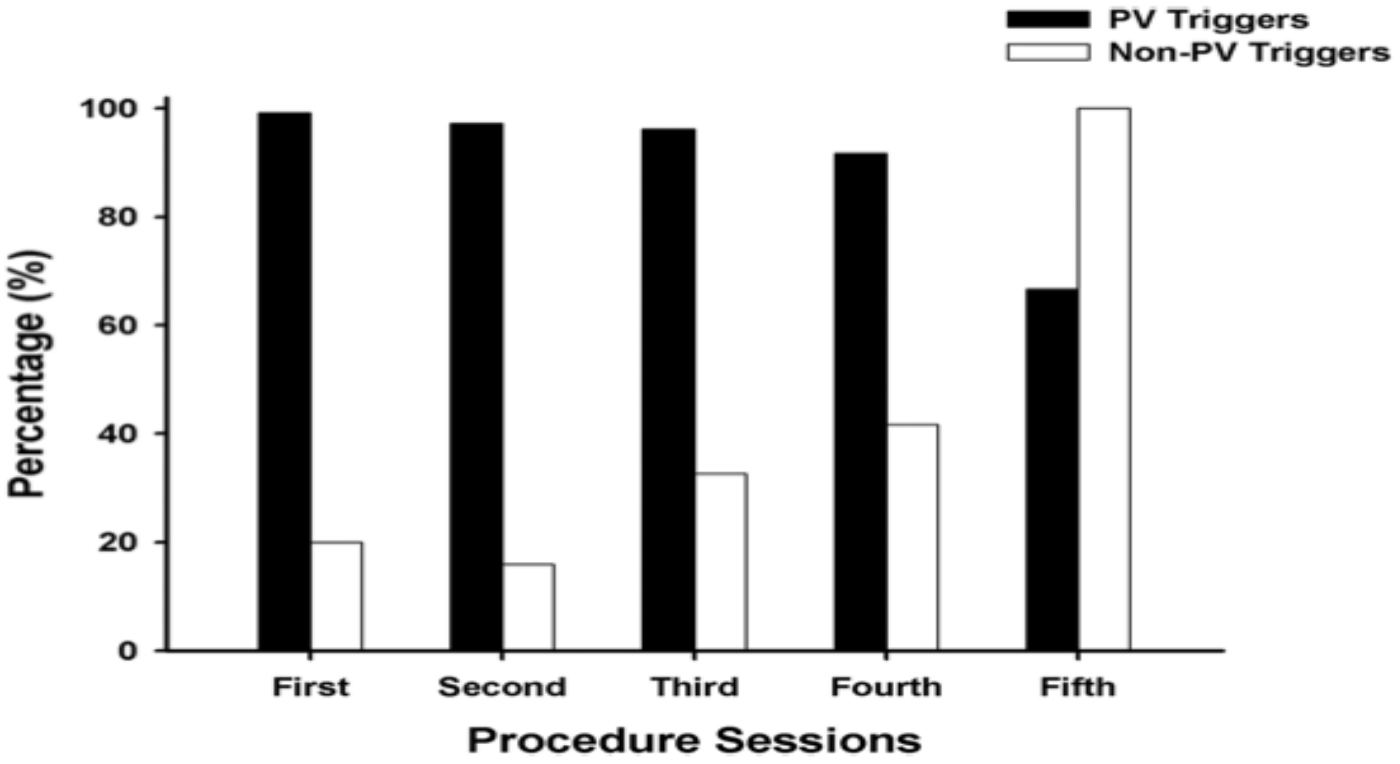
Characteristics of Multiple AF Ablation Procedures. ***Background:*** **The recurrence of atrial fibrillation (AF) is not uncommon in the era of catheter ablation. This study aimed to evaluate the characteristics of AF patients who underwent multiple (>2) ablation procedures.**

Methods and Results: **Of 666 consecutive patients (53 ± 11 y/o, 484 men) who underwent catheter ablation of AF (paroxysmal AF, n = 530), 144 (22%) underwent 2 procedures and 52 (8%) underwent more than 2 procedures due to symptomatic recurrences refractory to medication during 48 ± 23 months of follow-up. Baseline and procedural characteristics at the index procedure were investigated to determine their impact on the necessity of multiple procedures. After 2 procedures, 48 (92%) of 52 patients had pulmonary vein (PV) ectopic beats initiating AF. Coexisting PV and non-PV triggers were found in 23 of 48 patients. In a multivariate analysis, the presence of non-PV triggers (P = 0.004; odds ratio 2.69, 95% CI 1.37–5.28) at the index procedure was the only independent predictor of necessary multiple procedures. Among patients with non-PV ectopic beats initiating AF at the index procedure, the presence of ligament of Marshall triggers (P = 0.001, odds ratio 6.74, 95% CI 2.13–21.32) could predict the necessity of multiple procedures.**

Conclusions: **The need for multiple catheter ablation procedures can be predicted by the presence of non-PV ectopic beats initiating AF at the index procedure. However, PV-initiated AF remains the major cause of AF recurrence despite multiple catheter ablation procedures.** *(J Cardiovasc Electrophysiol, Vol. 26, pp. 1048-1056, October 2015)*

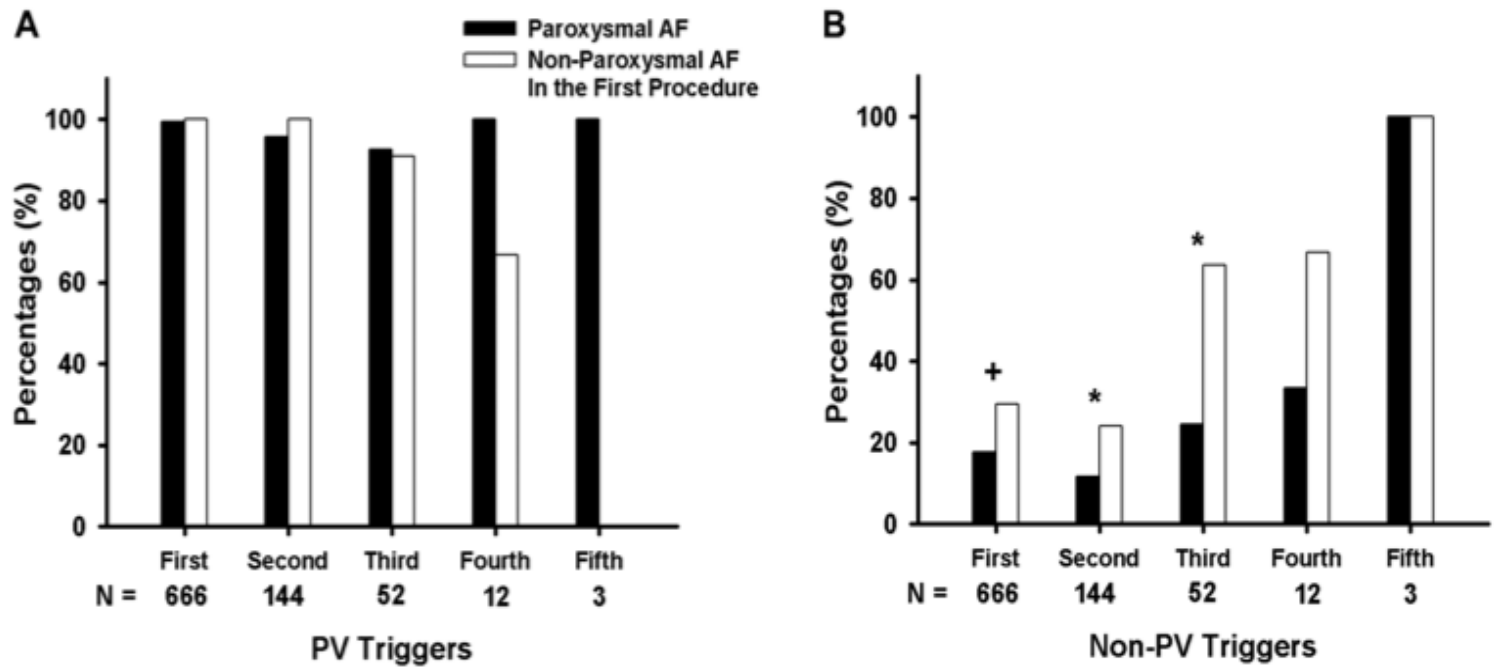


Lo LW et al. J Cardiovasc Electrophysiol. 2015 Oct;26 (10):1048-56.



Percentages of PV and non- PV AF triggers at each ablation session. As the number of procedure sessions in- creases, there is an increasing incidence of triggers from non-PV foci.

Lo LW et al. J Cardiovasc Electrophysiol. 2015 Oct;26 (10):1048-56.



Percentages of patients with (A) PV triggers and (B) non PV triggers at each ablation session. The classifications are based on AF types diagnosed at the first ablation procedure ($P < 0.001$, $P < 0.05$).

Lo LW et al. J Cardiovasc Electrophysiol. 2015 Oct;26 (10):1048-56.

Electrophysiologic Findings and Long-Term Outcomes in Patients Undergoing Third or More Catheter Ablation Procedures for Atrial Fibrillation

DAVID LIN, M.D., PASQUALE SANTANGELI, M.D., ERICA S. ZADO, P.A-C., RUPA BALA, M.D., MATHEW D. HUTCHINSON, M.D., MICHAEL P. RILEY, M.D., PH.D., DAVID S. FRANKEL, M.D., FERMIN GARCIA, M.D., SANJAY DIXIT, M.D., DAVID J. CALLANS, M.D., and FRANCIS E. MARCHLINSKI, M.D.

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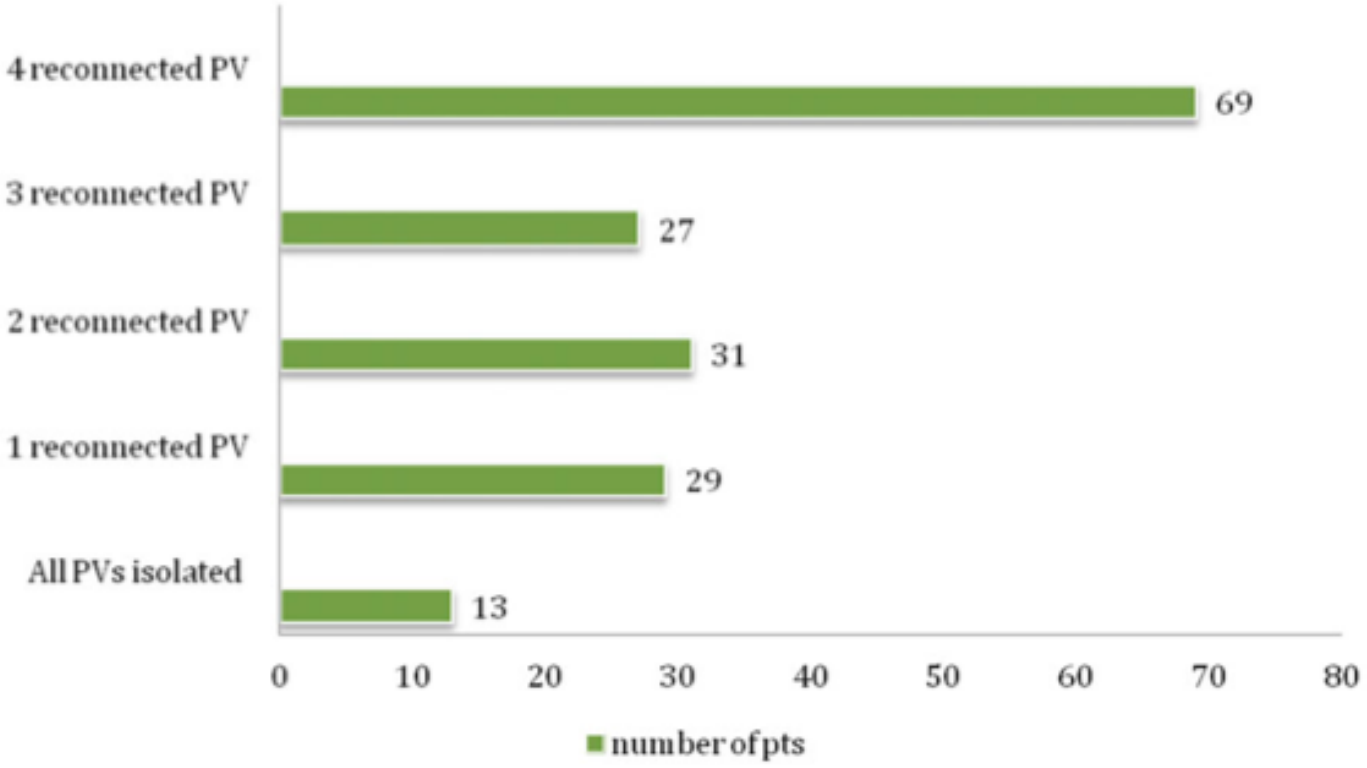
Outcomes After Third or More Catheter Ablation for Atrial Fibrillation. ***Introduction:*** **Pulmonary vein (PV) status, arrhythmia sources, and outcomes with ≥3 ablation procedures have not been characterized.**

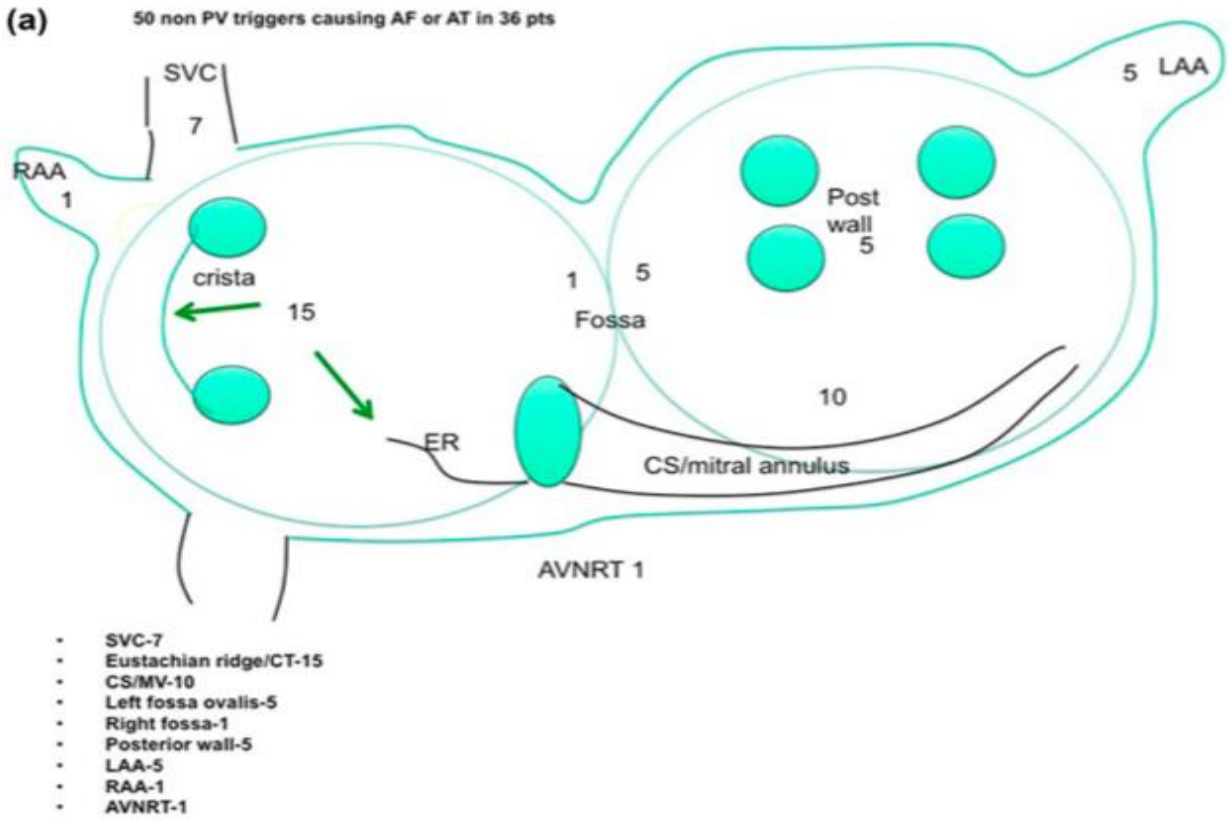
Methods and Results: **All patients with ≥3 procedures were included and underwent antral reisolation of reconnected PVs and ablation of non-PV triggers. Of 2,886 patients who underwent PVI, 181 (6%) had more than 2 ablation procedures (3 procedures in 146 and ≥4 procedures in 35). In 12 patients, the clinical arrhythmia was other than AF. Of the remaining 169 patients, 69 (41%) had 4 reconnected PVs, 27 (16%) had 3, 31 (18%) had 2, and 29 (17%) had 1. Only 13 (8%) had all PVs still isolated. Provocative techniques in 127 patients initiated PV triggers in 92 patients, including AF or PV atrial tachycardia in 64 (50%), and reproducible PV APDs in 28 (22%). Thirty-six (20%) had a new non-PV trigger targeted. At a mean of 36 months (12–119 months) after last procedure, 63 patients (47%) had no AF off antiarrhythmic drugs (AAD); 28 (21%) had no AF with AAD; and 18 (13%) had rare AF with good symptom control; 26 patients (19%) had recurrent AF.**

Conclusions: **At time of third or greater AF ablation, PV reconnection is the rule (92%) and PV triggers initiating AF can be demonstrated. Following repeat PVI and targeting non-PV triggers, 81% of patients had clinical AF control. Our findings suggest that PV reisolation and attempts to identify and eliminate non-PV triggers are effective and support the role of multiple repeat procedures for AF recurrence.**
(J Cardiovasc Electrophysiol, Vol. 26, pp. 371-377, April 2015)



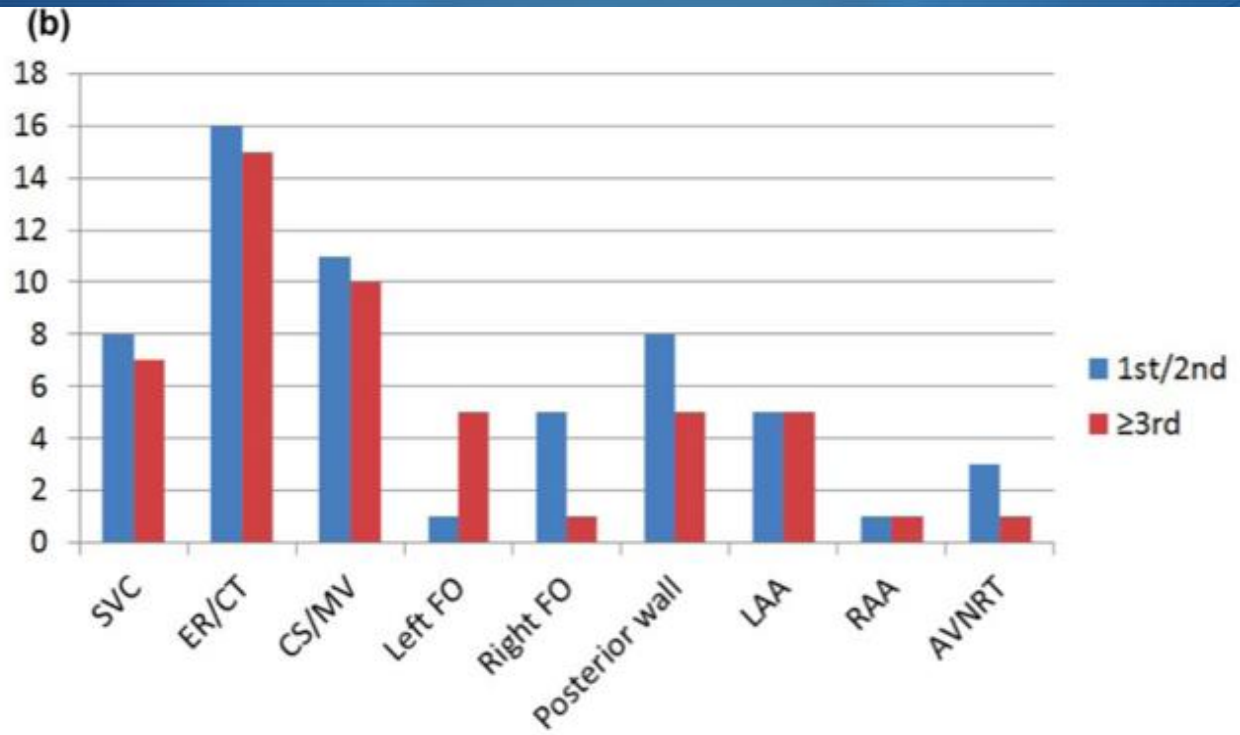
Status of PVs at time of repeat ablation in the 169 patients in whom the PVs were surveyed.

Lin D et al. J Cardiovasc Electrophysiol. 2015 Apr;26(4):371-7.



Panel a shows the distribution of new non-PV triggers at time of the third or fourth ablations.

Lin D et al. J Cardiovasc Electrophysiol. 2015 Apr;26(4):371-7.



Panel b illustrates the distribution of the non-PV triggers in first and second compared to third and fourth ablation.

Lin D et al. J Cardiovasc Electrophysiol. 2015 Apr;26(4):371-7.

Özet

- Af ablasyonu yapılan hastaların yaklaşık %25'inde tekrar ablasyon gerekir.
- PAF nedeni ile RF ablasyon sonrası re-ablasyon işleminde kryoablasyon veya RF ablasyondan hangisinin seçilmesi gerektiği tartışmalıdır.
- Tekrarlayan ablasyon işlemlerinde pulmoner ven izolasyonu temel hedef olmakla beraber, özellikle 2 den fazla ablasyon gereken hastalarda non-PV tetikleyiciler göz önünde bulundurulmalıdır.
- SVC, Eustachian ridge, CS, LFO, LAA, Posteriyor duvar tekrarlayan ablasyon gereken işlemlerde non-PV tetikleyicileri olarak özellikle göz önünde bulundurulmalıdır.

Sabrınız için teşekkür ederim.