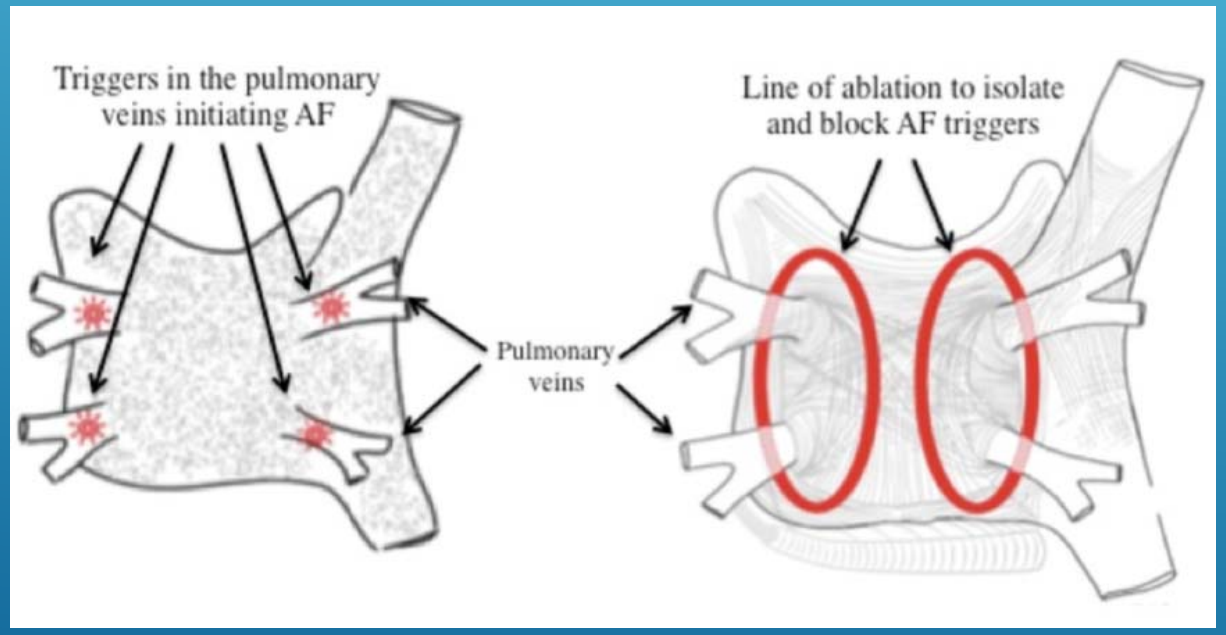
CFAE ABLASYONU

Dr. Serkan ÇAY

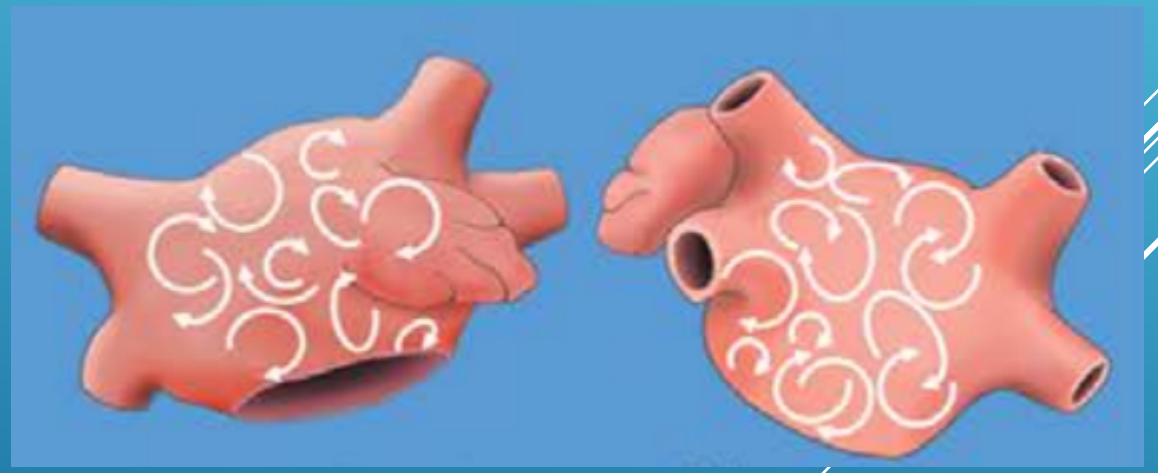
TYİH Aritmi

AF ablasyonunda 2 ana hedef

Tetikleyicilerin ablasyonu

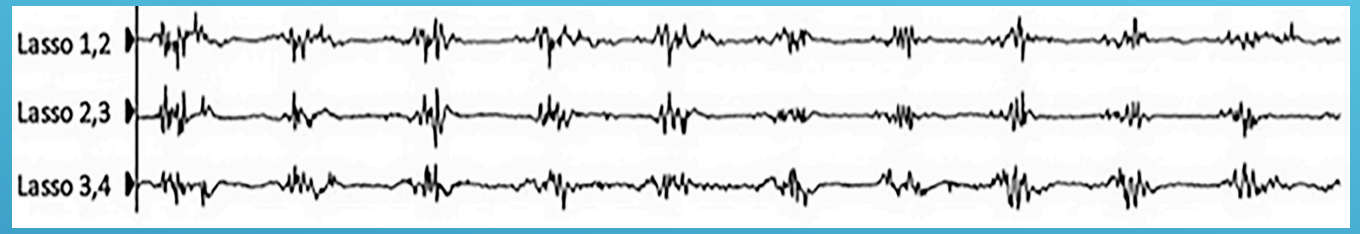


Substrat modifikasyonu



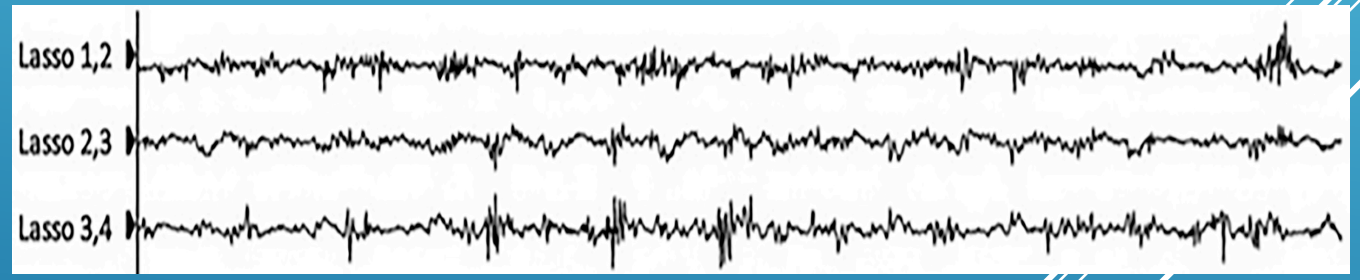
CFAE tanımı?

Düşük voltajlı izoelektrik hattı bozan 2-3-4 ya da daha fazla defleksiyon

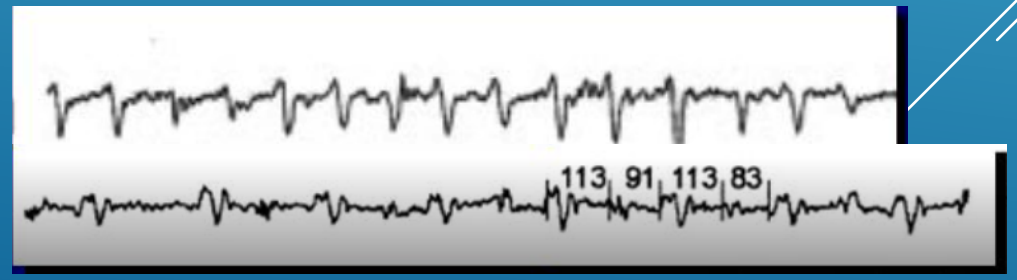


0.05-0.25? mV

Düşük voltajlı sürekli elektriksel aktivite

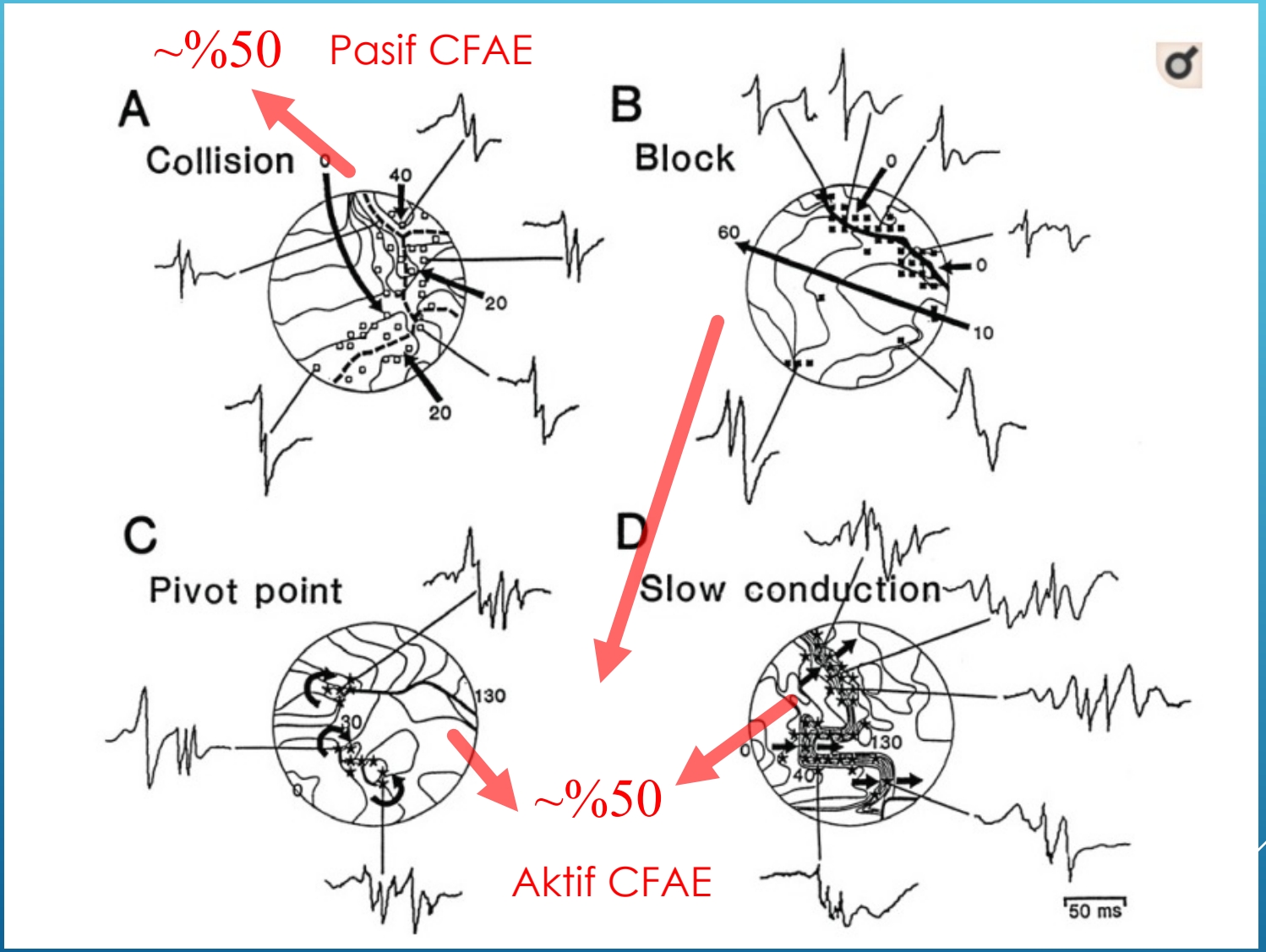


CL 120 ms altında olan elektrogramlar



Tanımını tam yapamam ama görsem tanırım

Mekanizma?


~%50
Pasif CFAE
A
Collision
0
40
20
20
B
Block
0
60
0
10
C
Pivot point
130
30
0
D
Slow conduction
0
130
40
~%50
Aktif CFAE
50 ms

CFAE ablasyonu

Primer tedavi?

Tetikleyiciler yerine
AF nin devamlılığından sorumlu
mekanizmanın ablasyonu

Nademanee et al, JACC 2004

⬇

Yaklaşık %90 hastada aritmi yok

PVI ya ek tedavi?

Basamaklı yaklaşım

Haissaguerre et al. JCE 2005

%95 sinüs ritmi

PVI

⬇

Lines

⬇

Substrat

Peki sonra…

Radiofrequency Catheter Ablation of Chronic Atrial Fibrillation Guided by Complex Electrograms

Hakan Oral, MD; Aman Chugh, MD; Eric Good, DO; Alan Wimmer, MD; Sujoya Dey, MD; Nitesh Gadeela, MD; Sundar Sankaran, MD; Thomas Crawford, MD; Jean F. Sarrazin, MD; Michael Kuhne, MD; Nagib Chalfoun, MD; Darryl Wells, MD; Melissa Frederick, MD; Jackie Fortino, RN; Suzanne Benloucif-Moore, NP; Krit Jongnarangsin, MD; Frank Pelosi, Jr, MD; Frank Bogun, MD; Fred Morady, MD

Circulation.2007

CFAE ablasyonu

⬇

Sinüs ritmi %57

A Randomized Assessment of the Incremental Role of Ablation of Complex Fractionated Atrial Electrograms After Antral Pulmonary Vein Isolation for Long-Lasting Persistent Atrial Fibrillation

Hakan Oral, MD, Aman Chugh, MD, Kentaro Yoshida, MD, Jean F. Sarrazin, MD, Michael Kuhne, MD, Thomas Crawford, MD, Nagib Chalfoun, MD, Darryl Wells, MD, Warangkna Boonyapisit, MD, Srikar Veerareddy, MD, Sreedhar Billakanty, MD, Wai S. Wong, MD, Eric Good, DO, Krit Jongnarangsin, MD, Frank Pelosi, JR, MD, Frank Bogun, MD, Fred Morady, MD

J Am Coll Cardiol 2009

PVI + CFAE ablasyonu

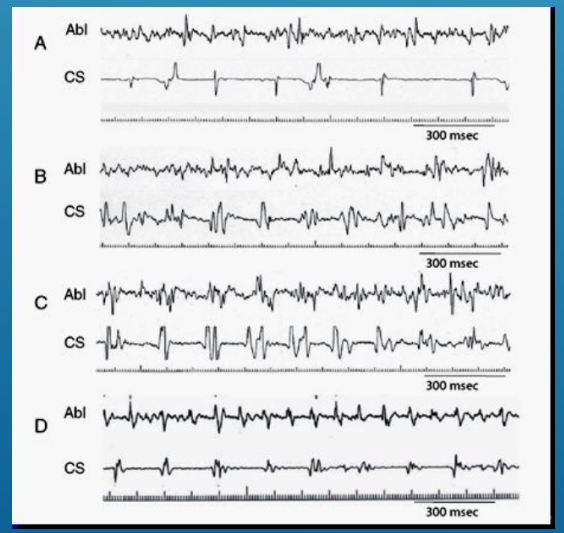
	After a single Ablation: SR at 10 months	
•*Group A:* •*Termination with PVAI (n=19)*	79%	
•**Group B**: •No Termination→Cardioversion (n=50)	38%	P=0.84
•**Group C**: •No termination – CFAE (n=50)	36%	

Fazladan 2 saat ablasyon

CFAE ler AF nin devamlılığında sanılanın aksine o kadar da kritik değiller

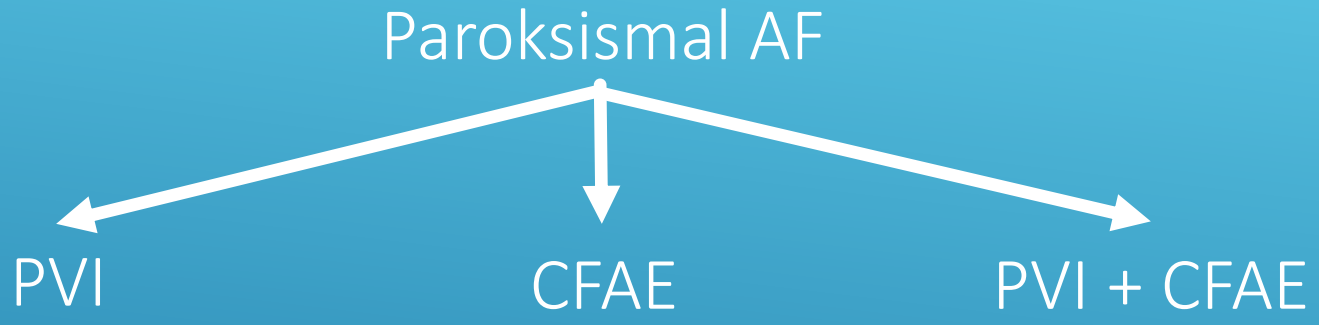
ya da

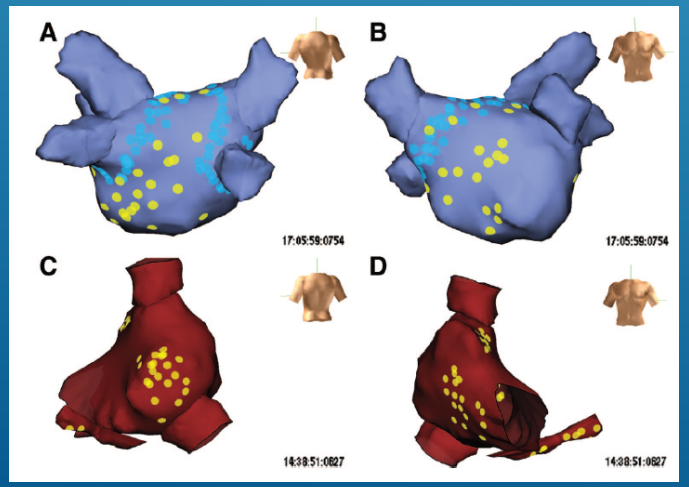
Sadece CFAE ablasyonu tek başına yeterli değil



Atrial Fibrillation Ablation Strategies for Paroxysmal Patients

Randomized Comparison Between Different Techniques





AAİ almadan 1 yıllık SR kalma

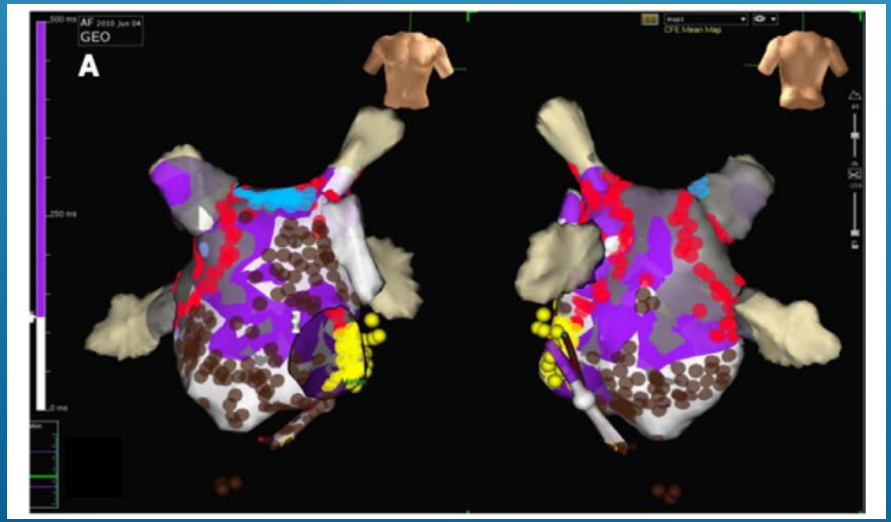
- ~%75 PVI ve PVI + CFAE
- ~%10 CFAE

Di Biase L, et al. Circ Arrhythmia Electrophysiol (2009) 2: 113

3D mapping algoritmaları

Carto CFAE modülü
EnSite CFE-mean aracı

Operatör bağımsız haritalama araçları



No Benefit of Complex Fractionated Atrial Electrogram Ablation in Addition to Circumferential Pulmonary Vein Ablation and Linear Ablation

Benefit of Complex Ablation Study

BOCA

Circ EP

PVI + lineer

%46

PVI + lineer + CFAE

%57

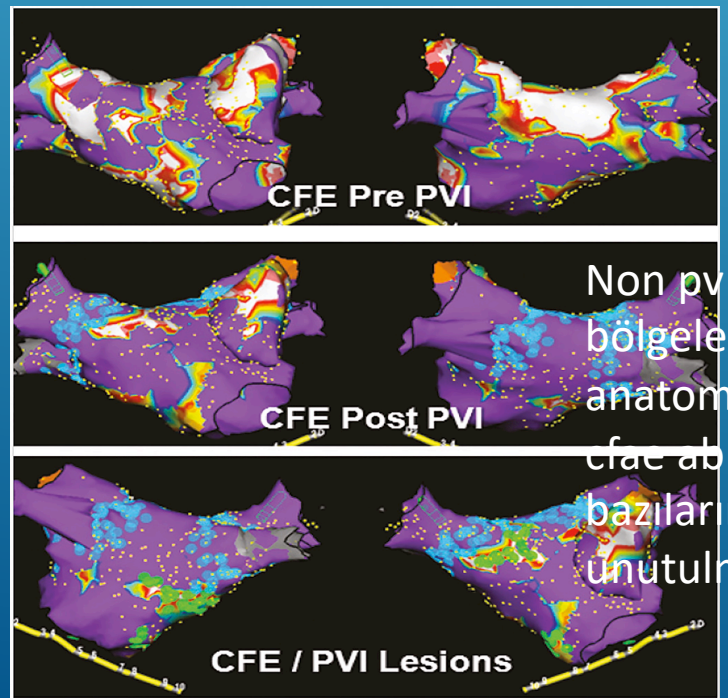
Randomized Ablation Strategies for the Treatment of Persistent Atrial Fibrillation

RASTA Study

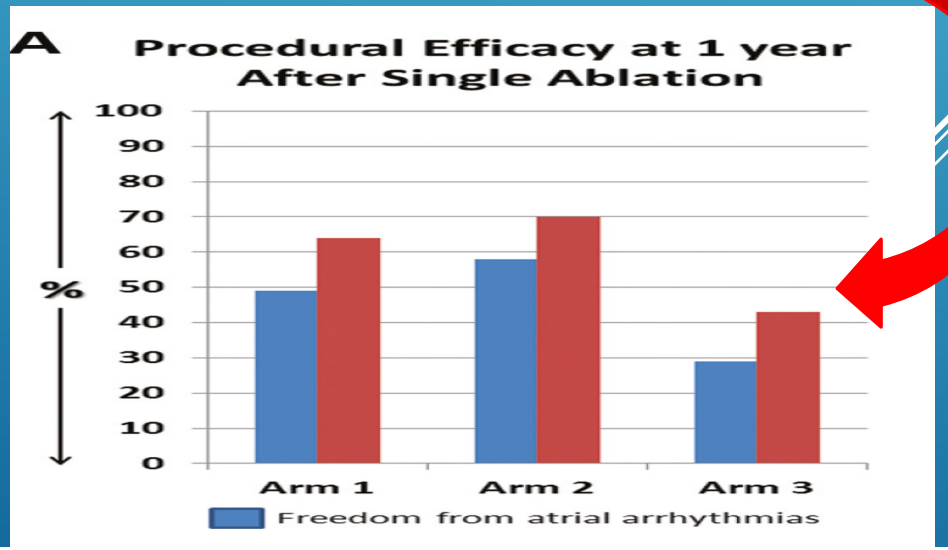
PVI+stimulated nonPV odaklar

PVI+stimulated +ampirik nonPV odaklar

PVI+stimulated nonPV odaklar + CFAE



Non pv odaklar, AF driver ve GP bölgeleri ile cfae arasında anatomik yakınlık var bu yüzden cfae ablasyonu ile non pv odakların bazılarının ablate edilebileceği unutulmamalıdır



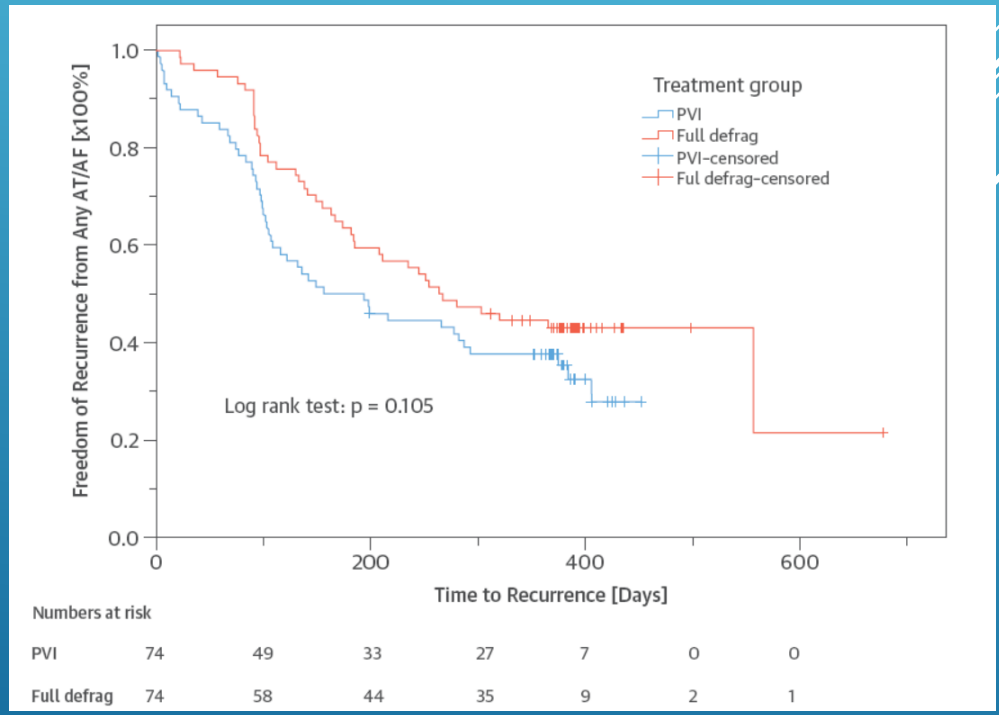
(*Circ Arrhythm Electrophysiol.* 2012;5:287-294.)

Pulmonary Vein Isolation Versus Defragmentation

The CHASE-AF Clinical Trial

Persistan AF

PVI PVI + CFAE + lineer hat



Ek bir fayda yok SR idamesi %65 vs. %60

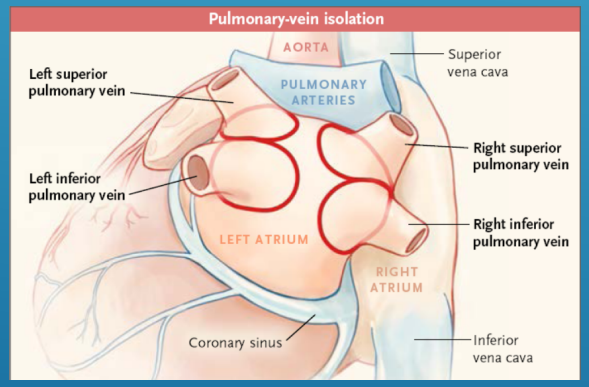
İşlem, floroskopi ve ablasyon zamanı daha fazla

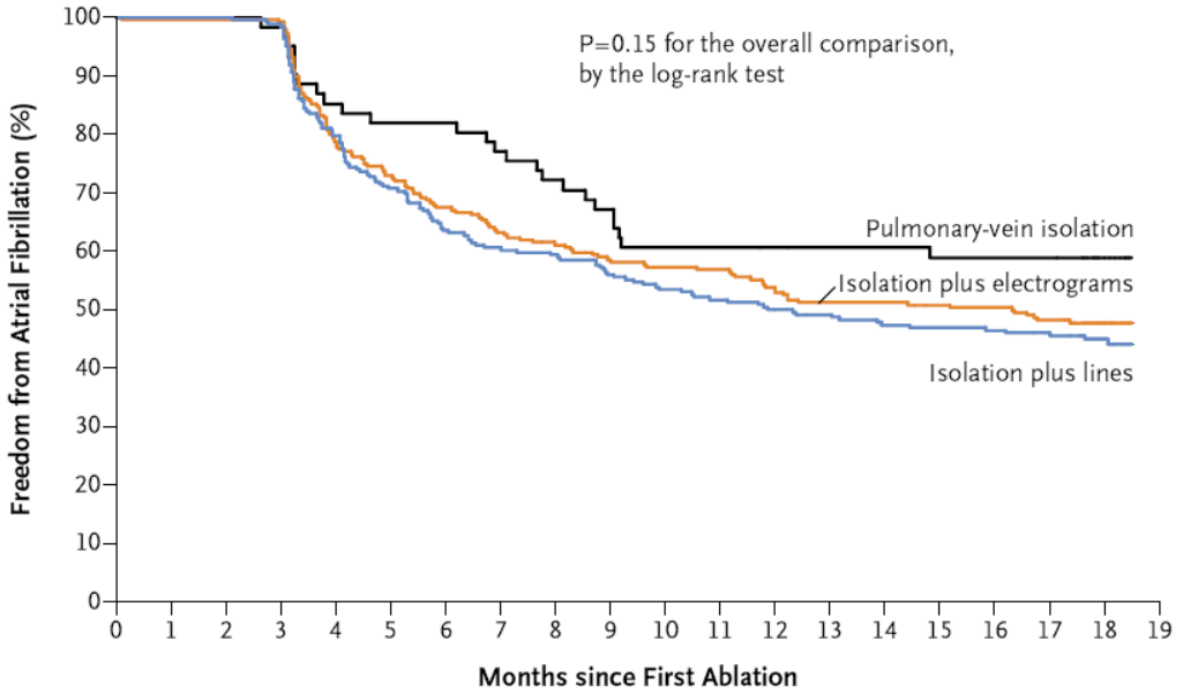
Vogler J, et al. JACC (2015) 66: 2743

Approaches to Catheter Ablation for Persistent Atrial Fibrillation

the STAR AF II

PVI





No. at Risk						
Pulmonary-vein isolation	61	60	50	41	36	23
Isolation plus electrograms	244	242	161	137	124	72
Isolation plus lines	244	240	152	133	115	57

En iyi sonuç PVI ile İşlem ve floroskopi süreleri daha az

Verma A, et al. NEJM (2015) 372: 1812

The modified stepwise ablation guided by low-dose ibutilide in chronic atrial fibrillation trial (The MAGIC-AF Study)

PVI + plasebo + CFAE

PVI + ibutilid + CFAE

	Ibutilide (n = 105)	Placebo (n = 95)	P-value
LA surface area with CFAE post-pulmonary vein isolation (%)[a]	23 ± 15	19 ± 13	0.20
Change in LA surface area with CFAE post-study drug administration (%)[a]	8 ± 7	1 ± 6	<0.001
AF termination with CFAE ablation, n (%)[b]	66 (71)	52 (56)	0.03

Outcome	Ibutilide (n = 97)	Placebo (n = 92)	P-value
Freedom from atrial arrhythmia after one procedure without drugs, n (%)	54 (56)	45 (49)	0.38
Freedom from atrial arrhythmia after one procedure with or without drugs, n (%)	60 (62)	47 (51)	0.14
Freedom from atrial arrhythmia after repeat procedures with or without drugs, n (%)	65 (67)	62 (67)	1.0

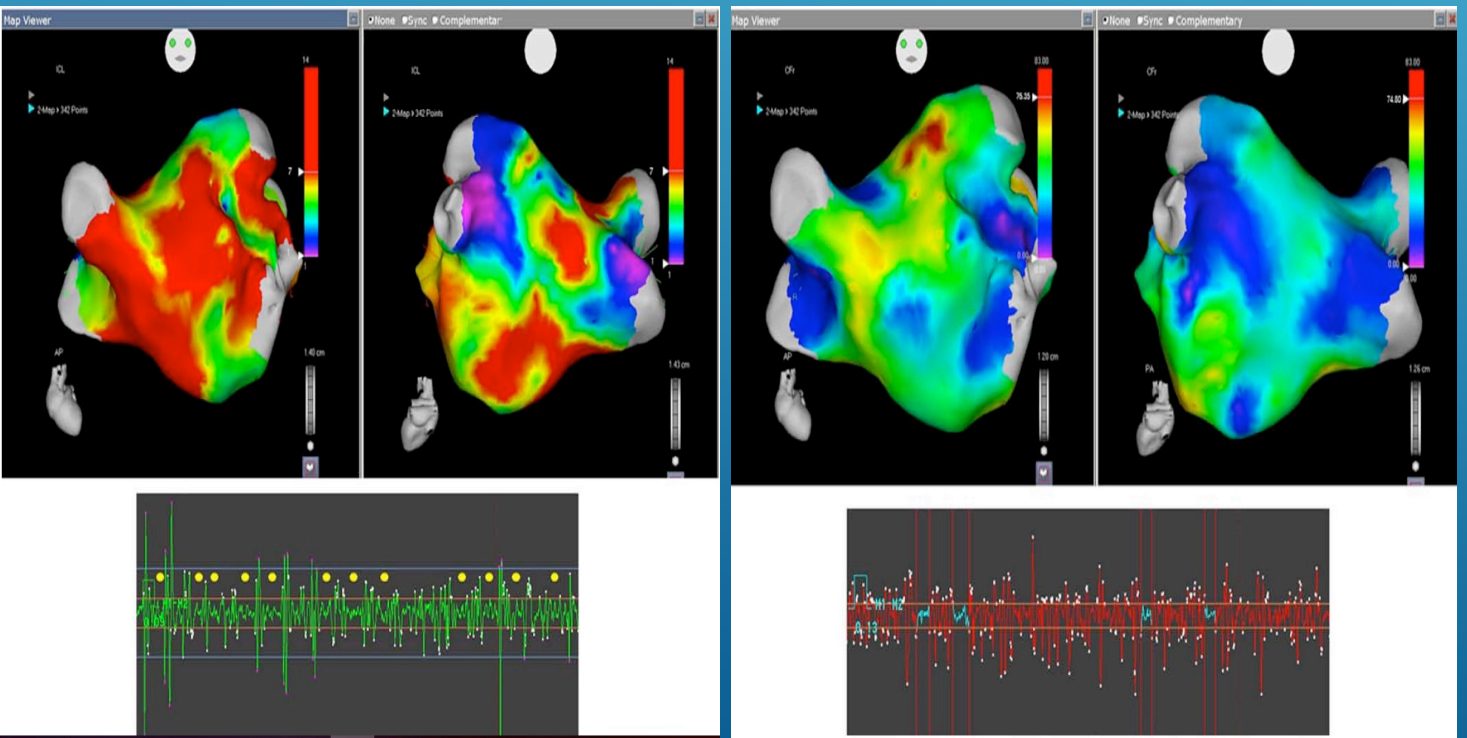
Selective Complex Fractionated Atrial Electrograms Targeting for Atrial Fibrillation Study (SELECT AF)

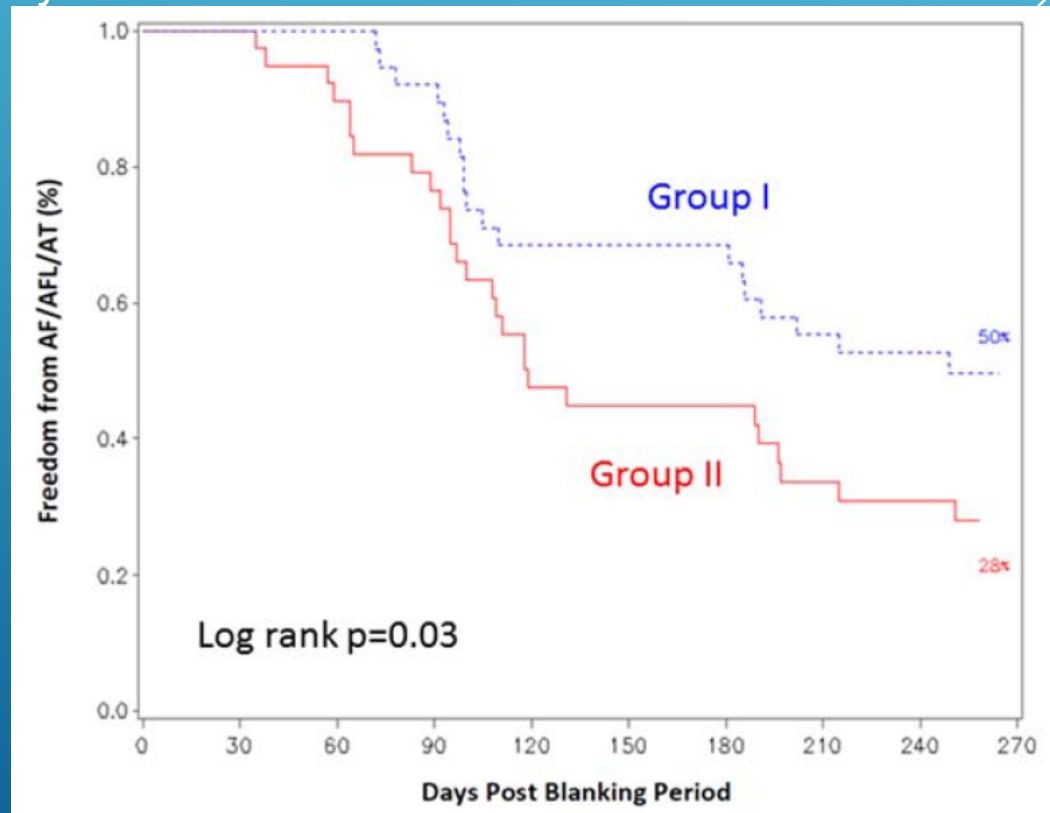
A Multicenter, Randomized Trial

Persistent/high-burden PAF

PVI+all CFAE

PVI + continuous electric activity





Haritalama ve ablasyon kısıtlılıkları

- Çok elektrotlu, simultan kayıt alabilen invazif ve noninvazif haritalama yöntemleri,
- Gelişmiş otomatik annotasyon algoritmaları,
- Gelişmiş yazılımsal algoritmalar (unipolar fractionation index / spatiotemporal stability index of CFAE),

olsa da

Mevcut haritalama teknolojileri ile tüm AF mekanizmalarının aydınlatılamaması

- Kontakt gücü ölçen, haritada doğru lokalizasyonu gösteren, etkili lezyon oluşturabilen kateterler,
- Ablasyon etkinliğini indirekt gösteren yazılımlar,
- Farklı enerji çeşitleri,

olsa da

Mevcut ablasyon teknolojileri ile tüm ablasyonlarda transmural lezyon oluşturulamaması

Sonuç olarak,

CFAE ablasyonunun tek başına ya da ek tedavi olarak AF ablasyonundaki etkisi,

- Farklı tanımlar,
- Farklı teknikler,
- Farklı operatörler,
- Farklı yorumlamalar,
- Farklı son noktalar,
- Farklı izlem süreleri,

nedenleriyle tam bir sonuca varmamaktadır.

Ayrıca,

Daha çok ablasyon,

- İzlemde daha çok AT,
- Daha bozuk LA mekanikleri,
- Daha çok intra-inter atriyal dissenkroni,
- Daha uzun işlem ve floro,
- Daha fazla komplikasyon,

ile ilişkilidir.