Atriyal fibrilasyon ablasyonunda kullanılan cihazlar

CRYO

Dr. Serkan Topaloğlu

Atriyal Fibrilasyon Zirvesi

2013 KKTC

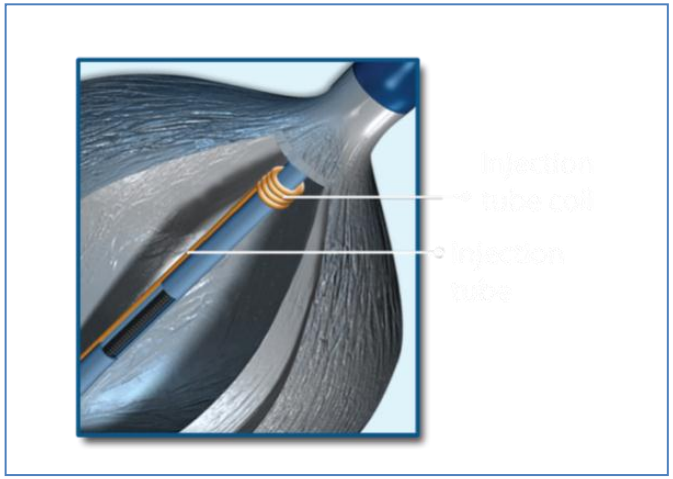
Neden Ablasyon yapıyoruz

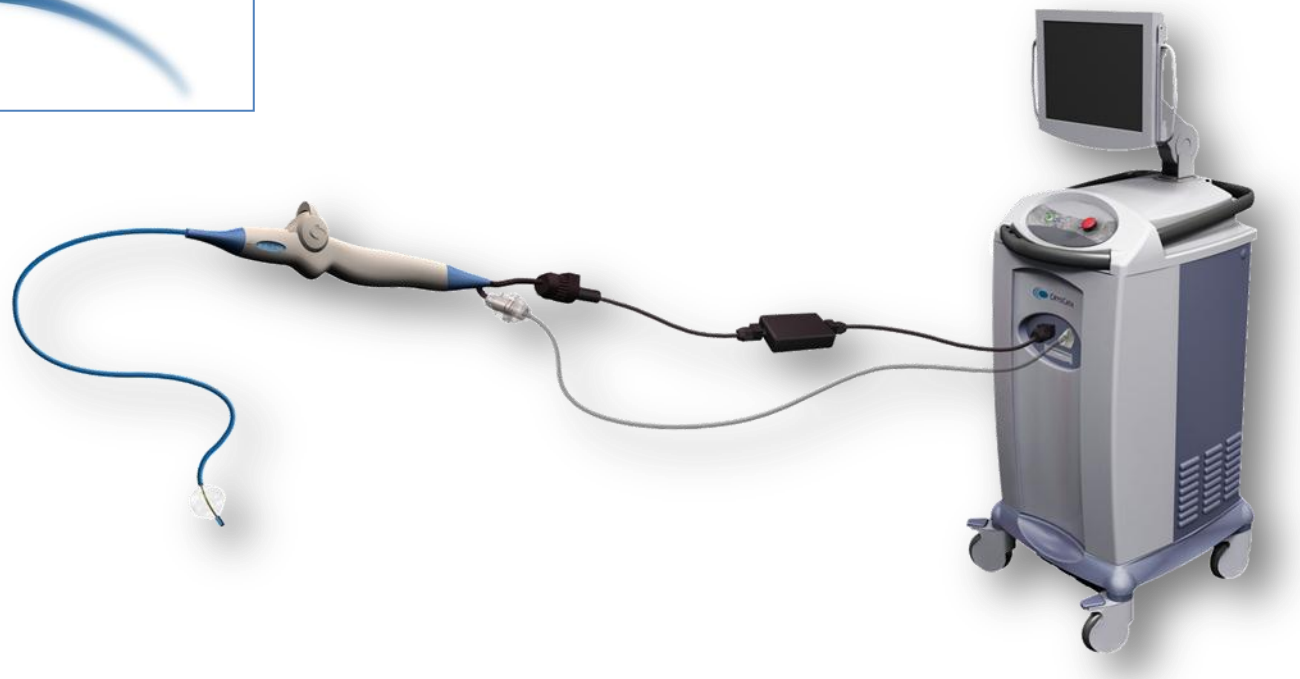
- Yaşam kalitesini düzeltmek
- Stroke riskini azaltmak
- Kalp yetmezliği riskini azaltmak
- Yaşam süresini uzatmak

2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions, Endpoints, and Research Trial Design

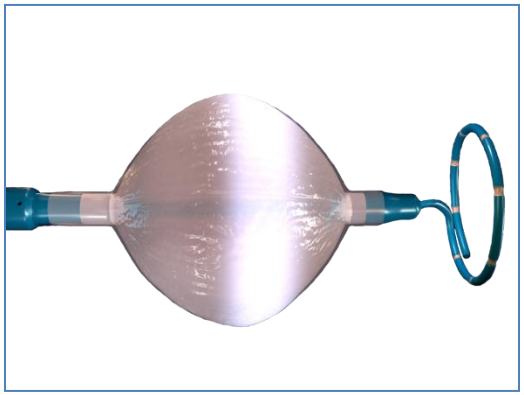
	CLASS	LEVEL
INDICATIONS FOR CATHETER ABLATION of AF		
Symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication		
Paroxysmal: Catheter ablation is recommended*	I	A
Persistent: Catheter ablation is reasonable	IIa	B
Longstanding Persistent: Catheter ablation may be considered	IIb	B
Symptomatic AF prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent		
Paroxysmal: Catheter ablation is reasonable	IIa	B
Persistent: Catheter ablation may be considered	IIb	C
Longstanding Persistent: Catheter ablation may be considered	IIb	C

Europace Advance Access published March 1, 2012

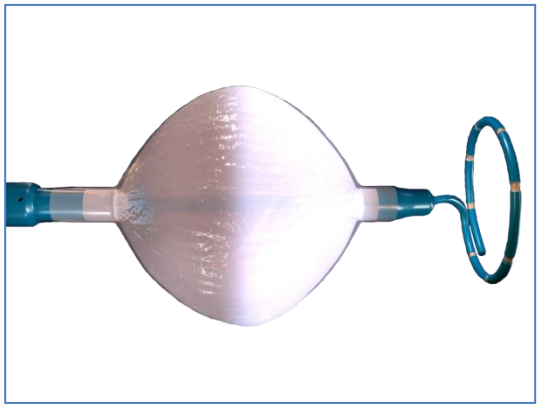

injection tube coil
injection tube

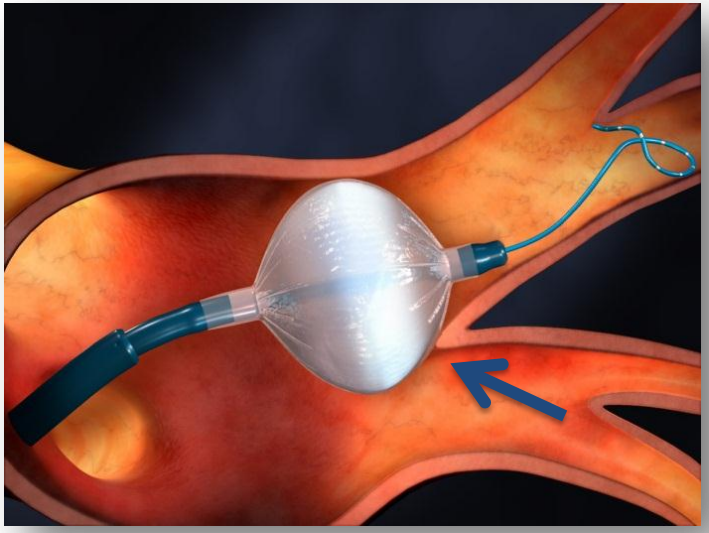


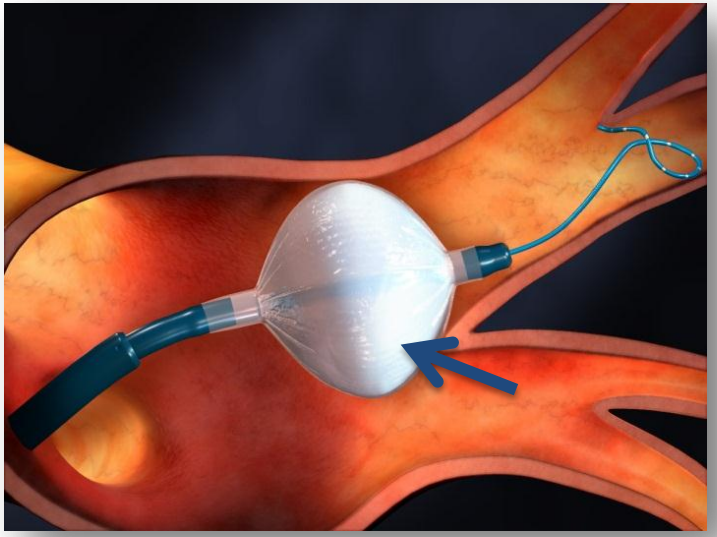
Arctic Front Cryoballoon

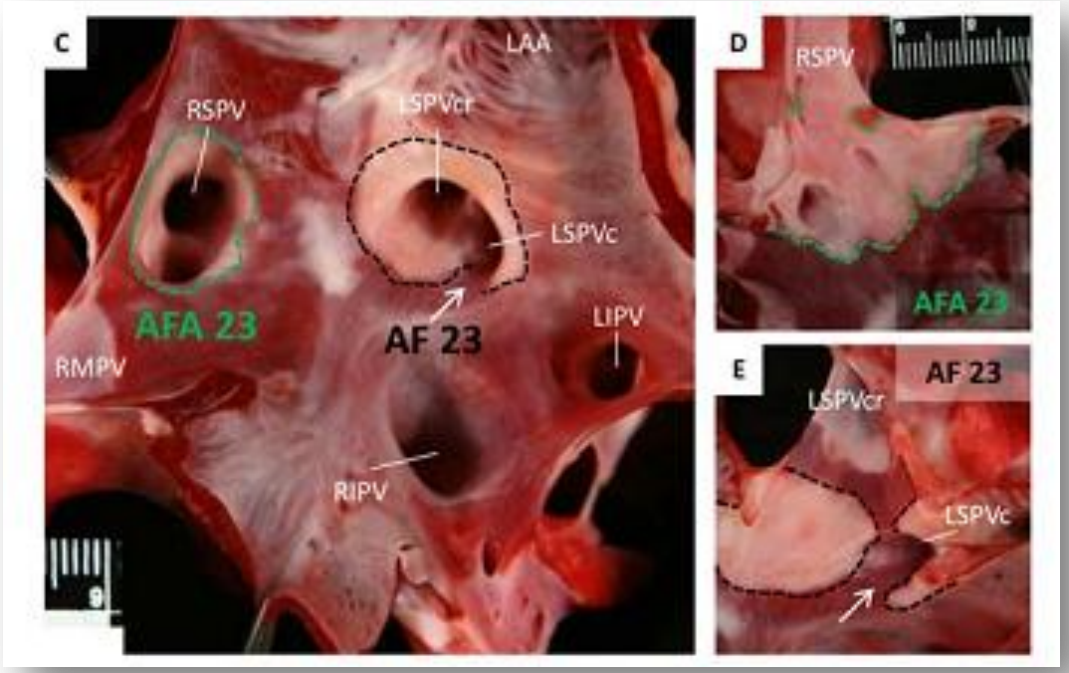


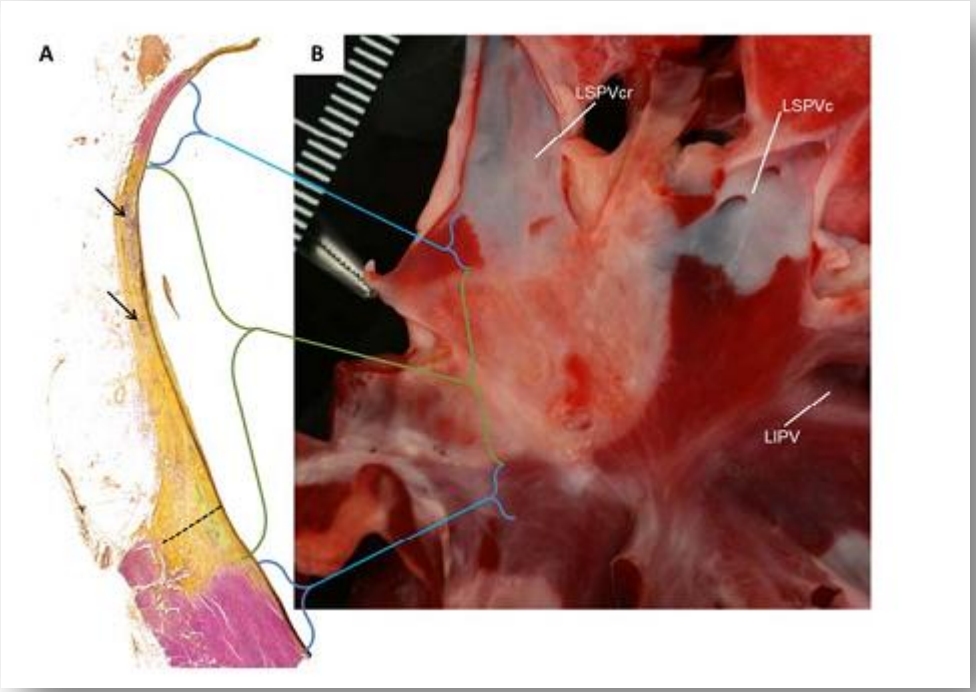
Arctic Front Advance Cryoballoon





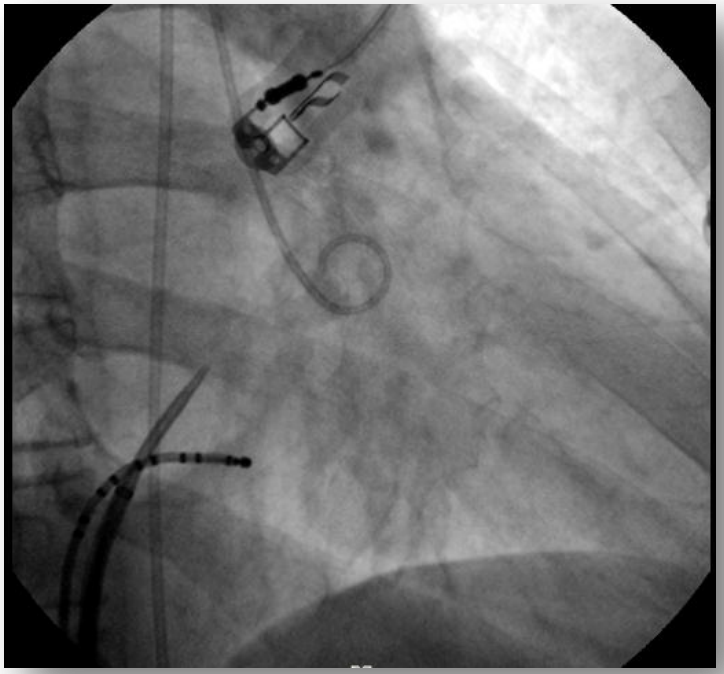


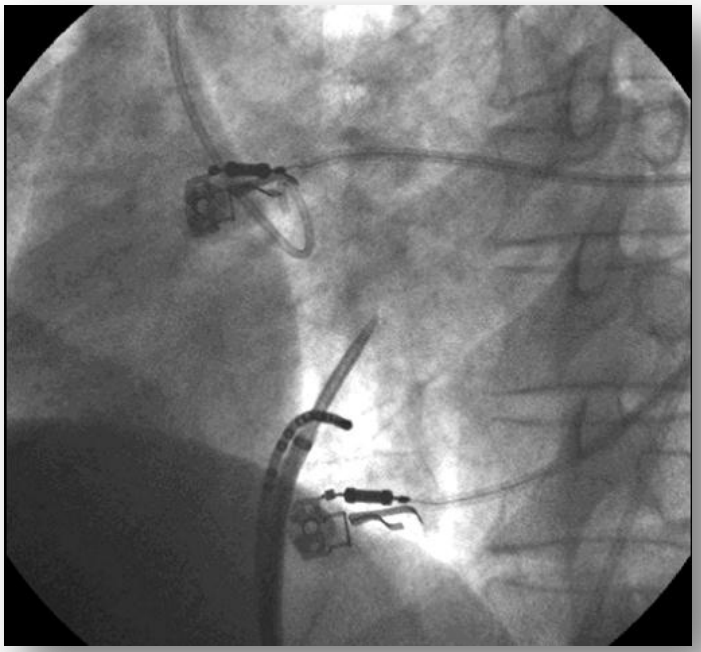

C
LAA
RSPV
LSPVcr
LSPVc
AFA 23
AF 23
LIPV
RMPV
RIPV
D
RSPV
AFA 23
E
AF 23
LSPVcr
LSPVc

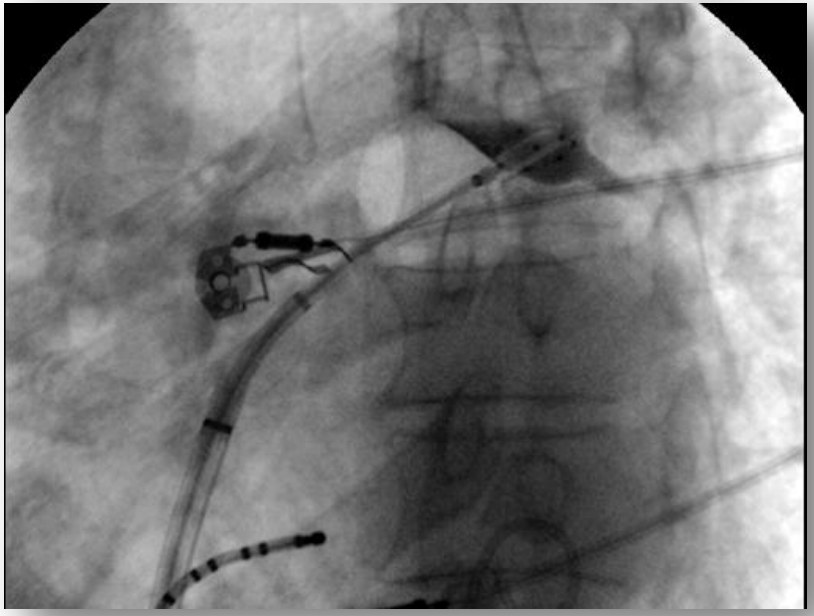

A
B
LSPVcr
LSPVc
LIPV

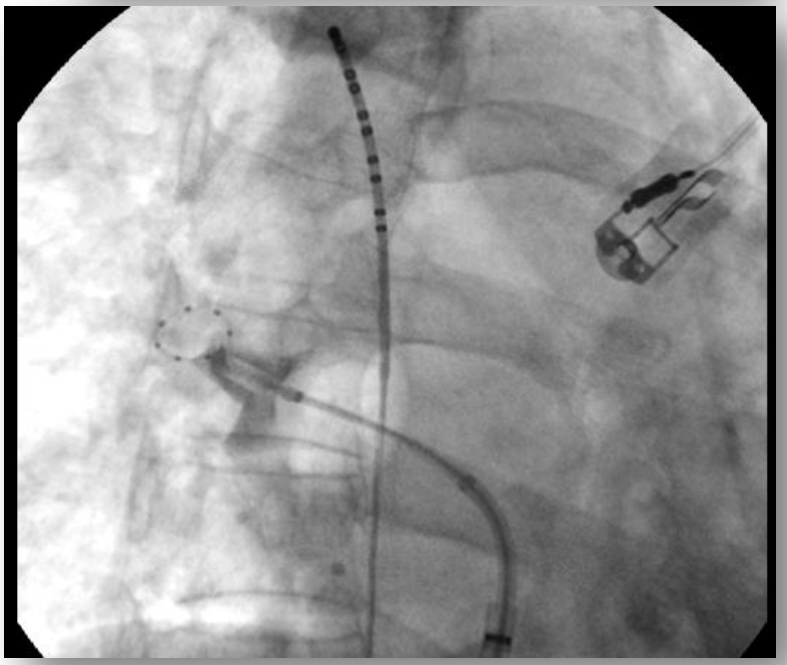
Neden cryo enerji

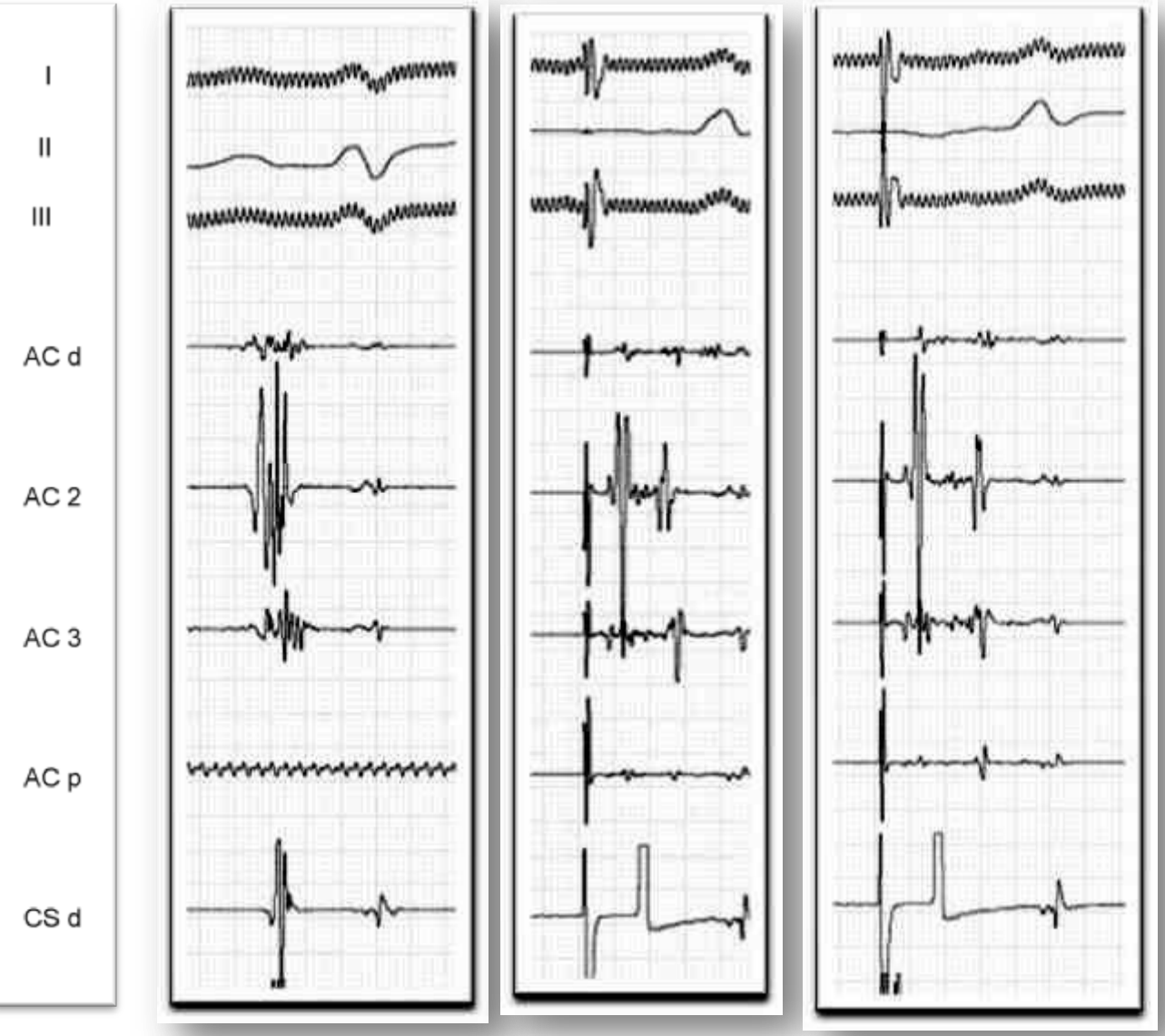
- Kateter stabilitesi yüksek
- Demerkasyon hattı düzgün homojen lezyon oluşturur.
- Endokardiyal yüzey bozulması daha az
- Tromboembolik risk daha az
- İyleşirken doku kontraksiyonu daha az
- Daha az ösefagial hasar ve pulmoner stenoz

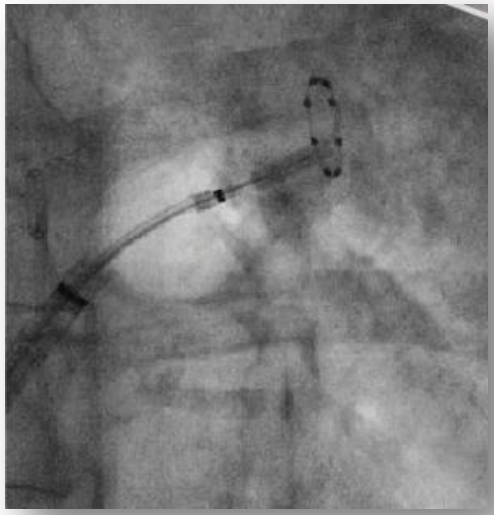




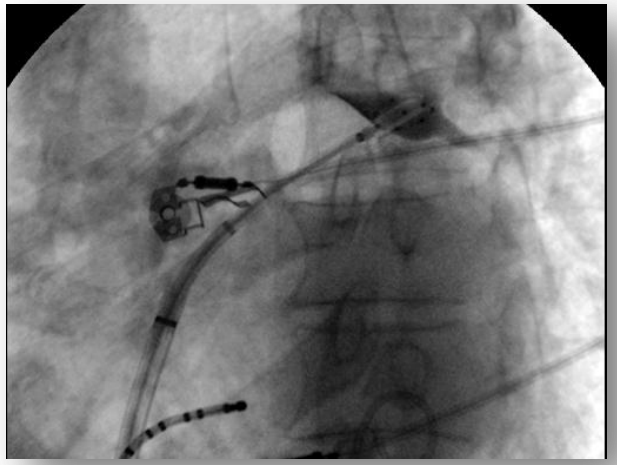


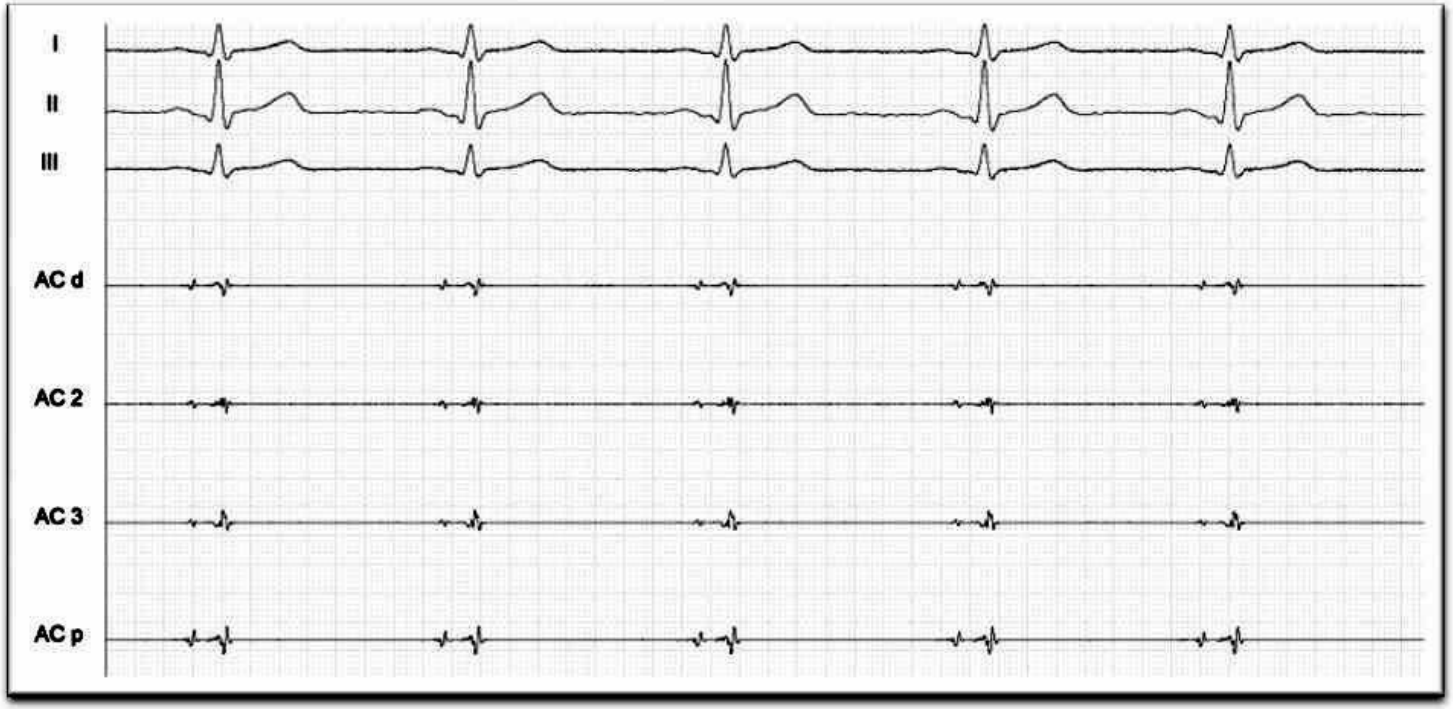


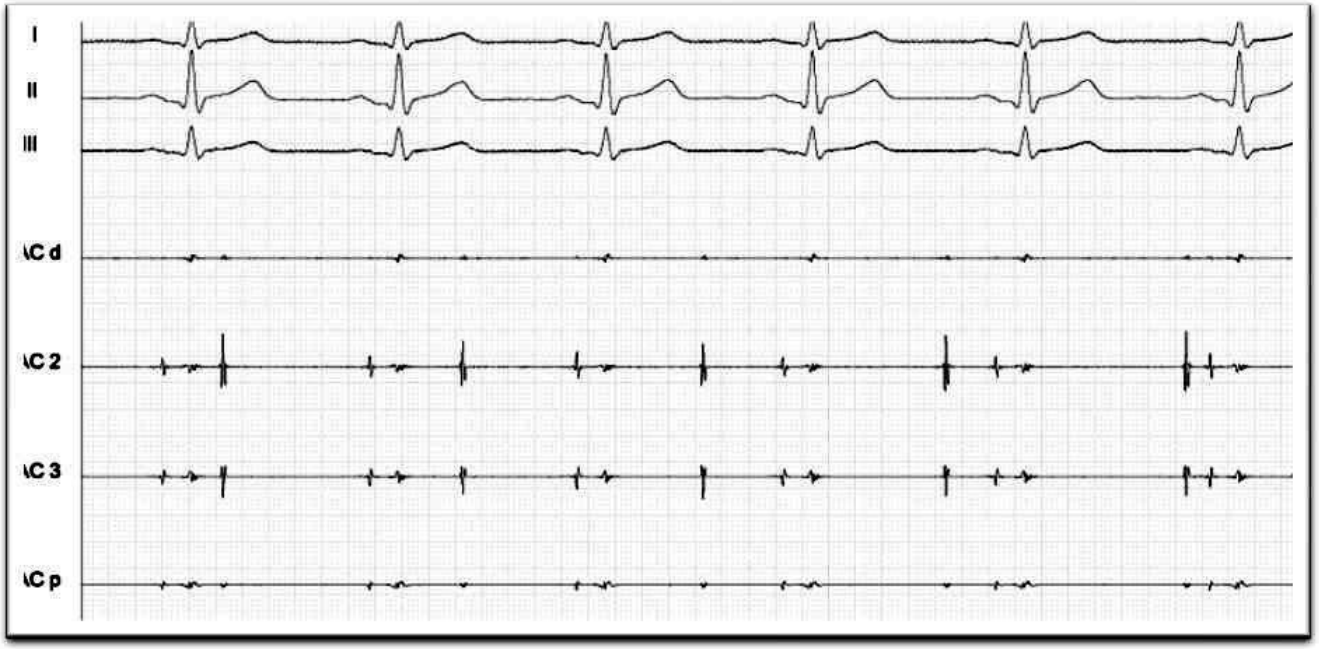

I
II
III
AC d
AC 2
AC 3
AC p
CS d

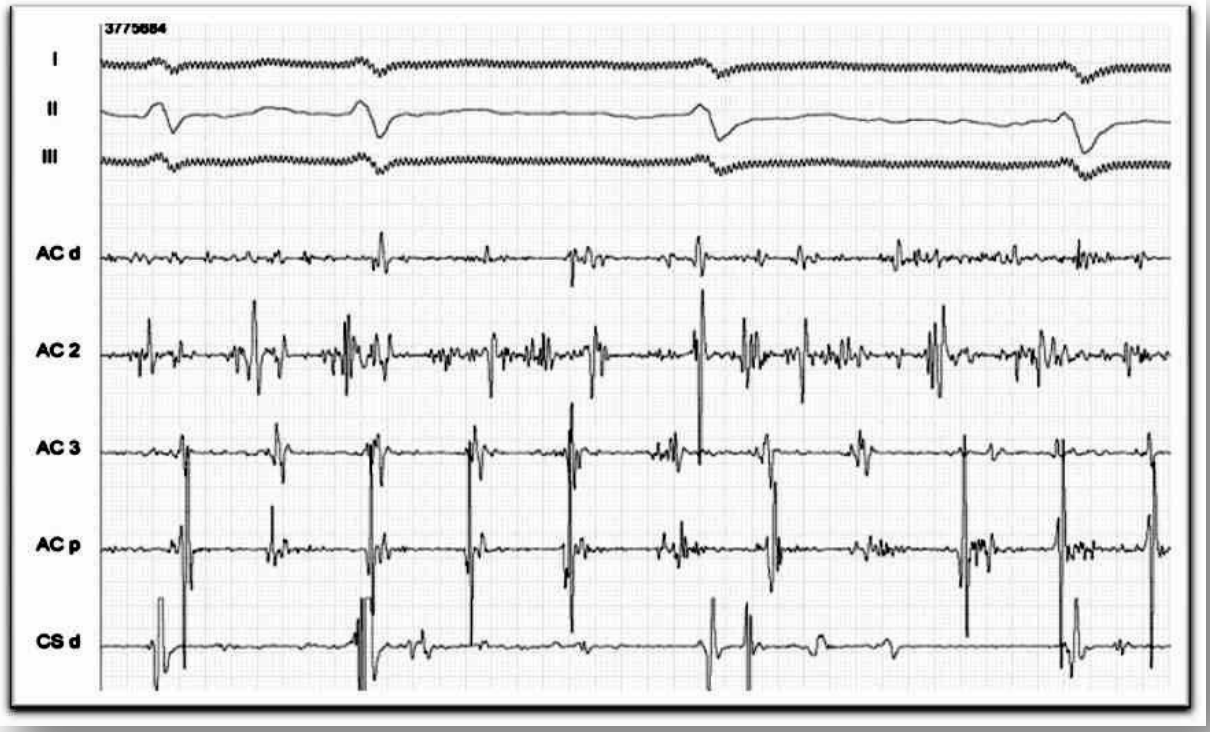


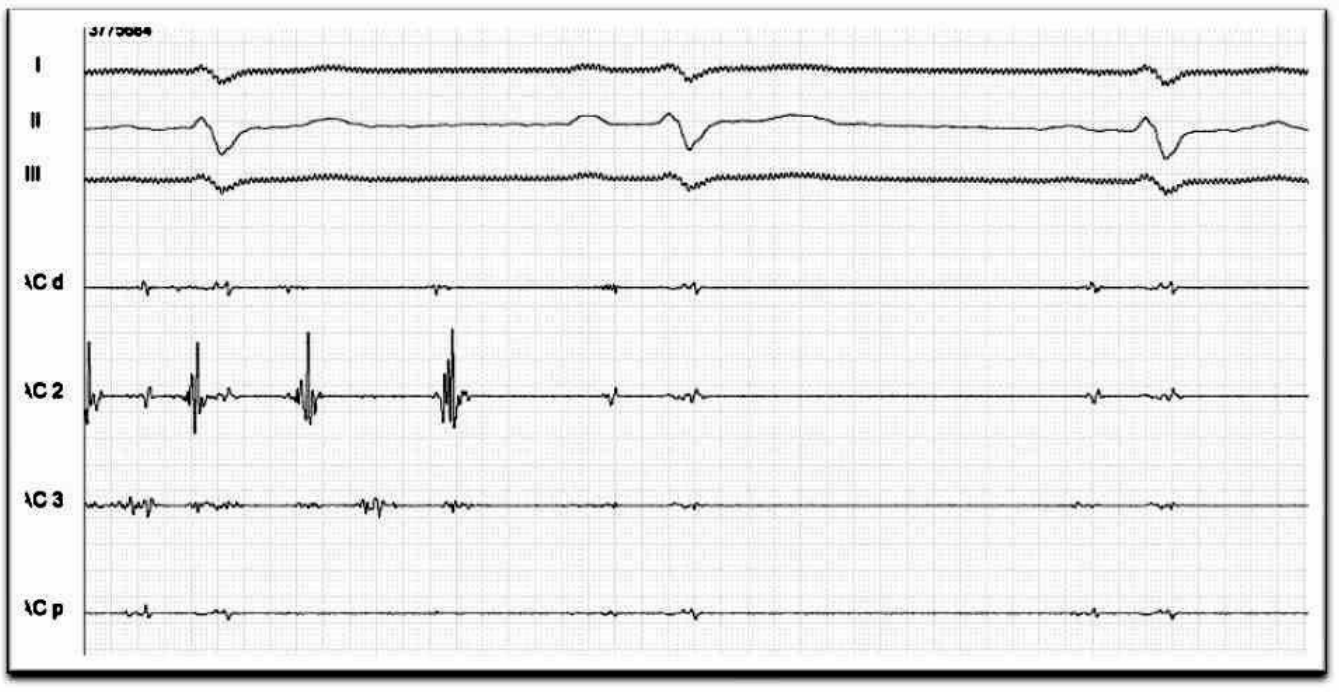

I
II
III
AC d
AC 2
AC 3
AC p
CS d
CS p

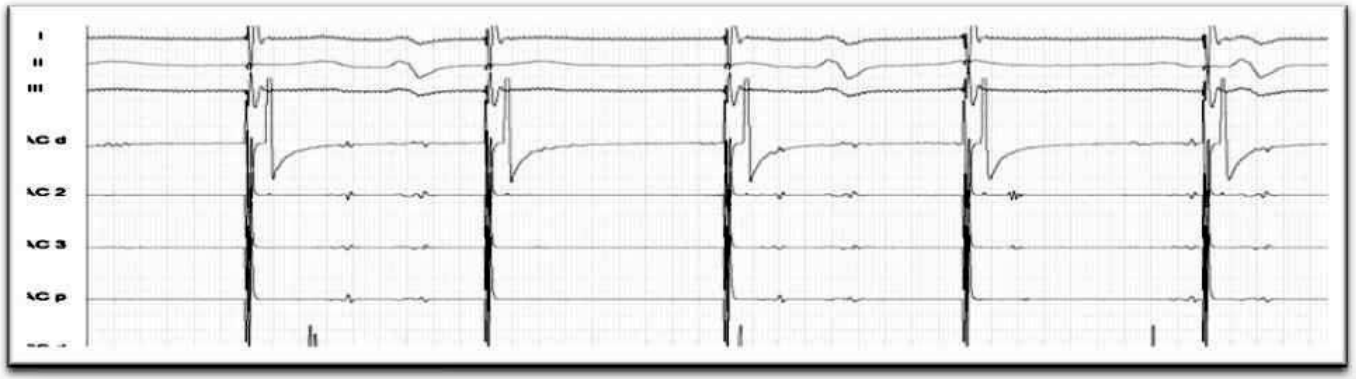


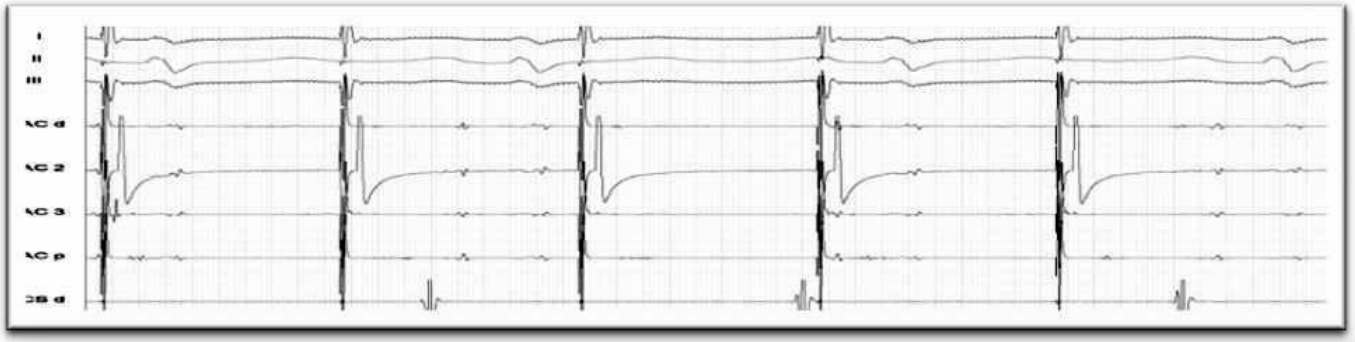

I
II
III
AC d
AC 2
AC 3
AC p

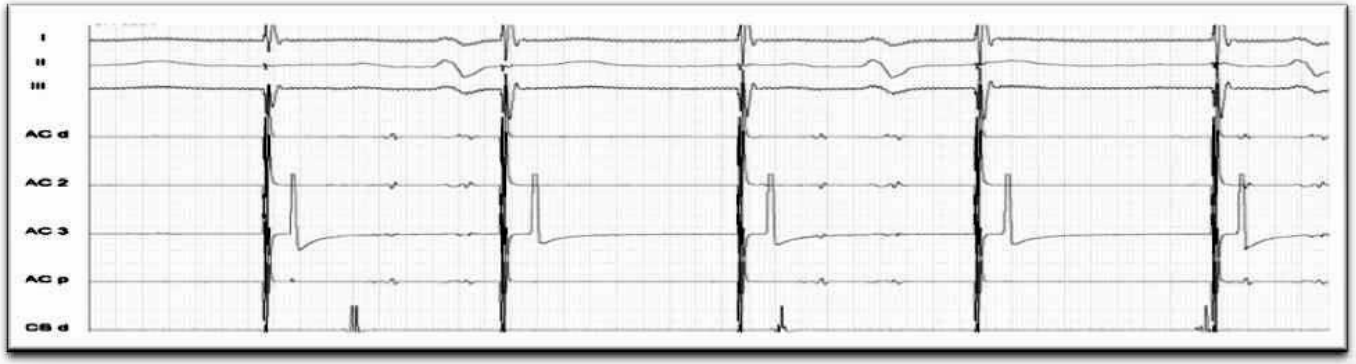

I
II
III
AC d
AC 2
AC 3
AC p


I
II
III
AC d
AC 2
AC 3
AC p
CS d

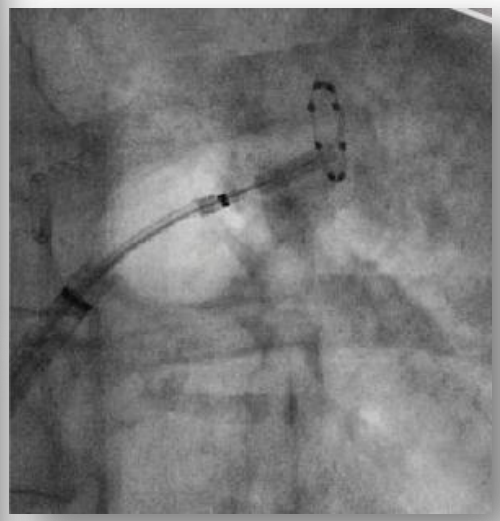

I
II
III
AC d
AC 2
AC 3
AC p


I
II
III
AC d
AC 2
AC 3
AC p


I
II
III
AC d
AC 2
AC 3
AC p
CS d


I
II
III
AC d
AC 2
AC 3
AC p
CS d


I
II
III
AC d
AC 2
AC 3
AC p
CS d



Antikoagülasyon

- Ablasyon öncesi TEE
- Ablasyon sırasında heparinizasyon
- Ablasyonda sonra 2-3 ay warfarin veya yeni antikoagülanlar
- Daha sonra $CHADS_2$veya CHA_2DS_2VASc skoruna göre antikoagülasyon.
- Antikoagülan kesilecekse çok yakın sık EKG monitorizasyonu ?

Takip

- İşlem sonrası 3 ay antiaritmik ilac
- Proton pompa inhibitörü
- Kortikosteroid ???
- Statin ???
- Renin anjiotensin aldesteron sistemi blokajı ???
- %20-40 hastada tekrar ablasyon gerekir.
- Sıkı takip

Başarısızlığın nedenleri

- Non-paroksismal AF
- Uyku apnesi- obezite
- Artmış sol atriyal çap
- İleri yaş
- Hipertanisyon
- Sol atriyal fibrozis (MRI)

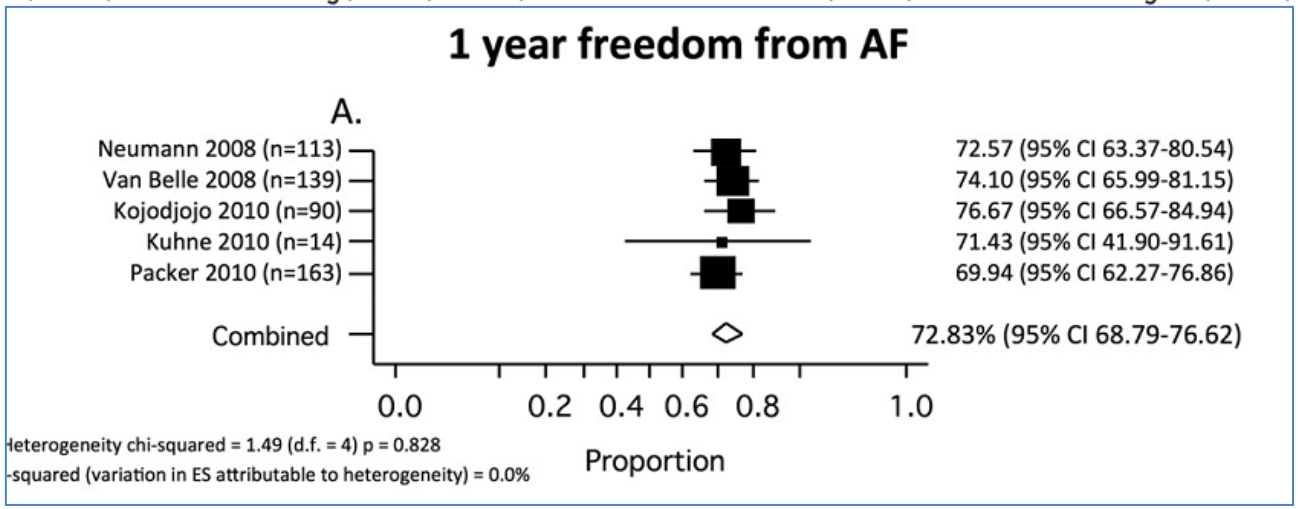
Nüks nedenleri

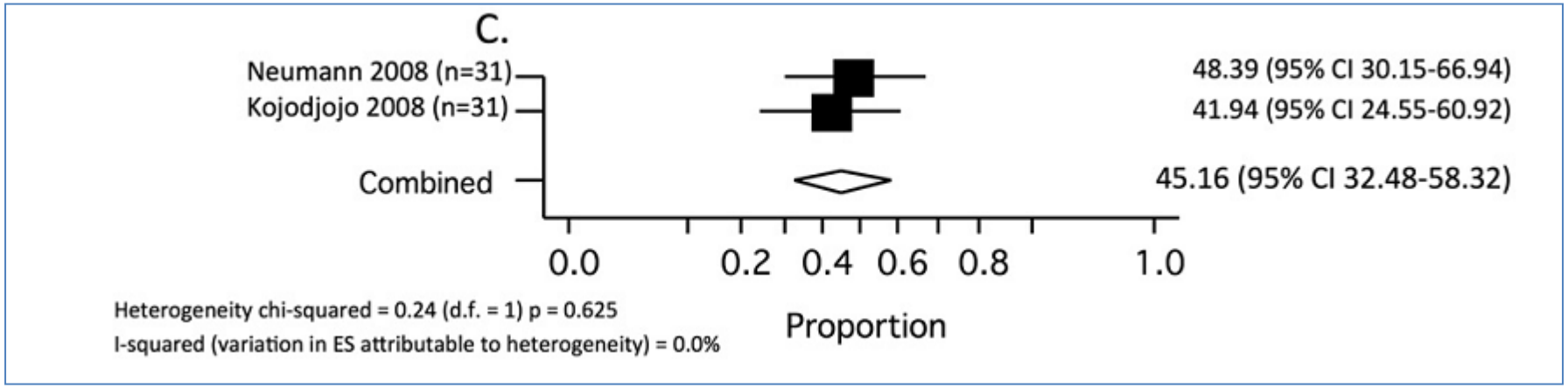
- Rekonneksiyon
- Non-PV fokus
- Otonomik reinervasyon
- Devam eden elektriksel ve yapısal remodeling

CONTEMPORARY REVIEW

Efficacy and safety of cryoballoon ablation for atrial fibrillation: A systematic review of published studies

Jason G. Andrade, MD,* Paul Khairy, MD, PhD,* Peter G. Guerra, MD,* Marc W. Deyell, MD, MSc,†





Heart Rhythm, Vol 8, No 9, September 2011

Cryoballoon Ablation of Pulmonary Veins for Paroxysmal Atrial Fibrillation

First Results of the North American Arctic Front (STOP AF) Pivotal Trial

Douglas L. Packer, MD,* Robert C. Kowal, MD,† Kevin R. Wheelan, MD,† James M. Irwin, MD,‡

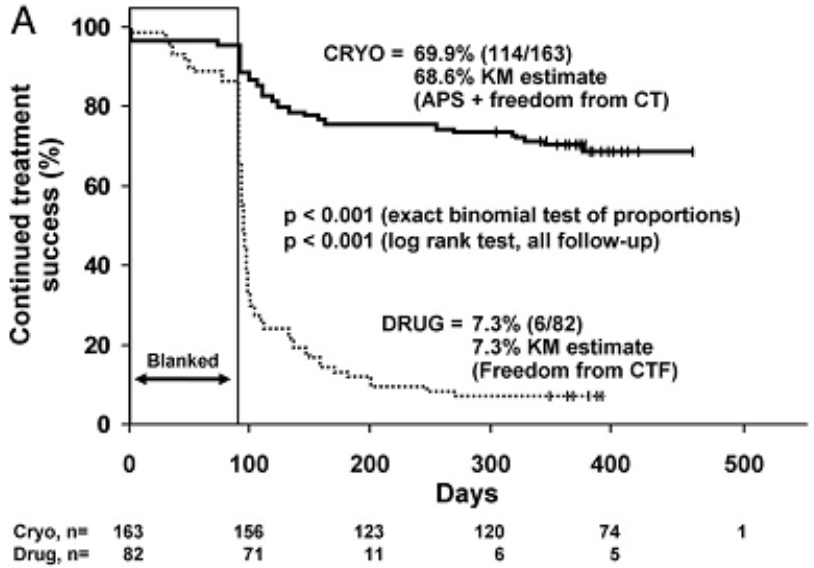


Table 2 Summary of Adverse Events On-Treatment Analysis

	Drug Treatment (N = 82)		Cryoablation (N = 163)		All Cryoballoon-Treated (N = 228)	
Type of Adverse Event	No. of Events	%	No. of Cryoablation Events	%	All Events	%
Stroke	0	0.0	4	2.5	5	2.2
TIA	0	0.0	3	1.8	4	1.8
Tamponade	0	0.0	1	0.6	2	0.9
Myocardial infarction	0	0.0	2	1.2	2	0.9
Hemorrhage requiring transfusion	1	1.2	3	1.8	3	1.3
New atrial flutter	12	14.6	6	3.7	8	3.5
Atrial esophageal fistula	0	0.0	0	0.0	0	0.0
Death	0	0.0	1	0.6	1	0.4
New or worsened arteriovenous fistula	0	0.0	2	1.2	2	0.9
Pseudoaneurysm	0	0.0	1	1.6	2	0.9
Phrenic nerve palsy	0	0.0	22	13.5	28	12.3
Persistent phrenic nerve palsy	0	0.0	4	2.5	4	1.8
PV stenosis	0	0.0	5	3.1	7	3.1

JACC Vol. 61, No. 16, 2013

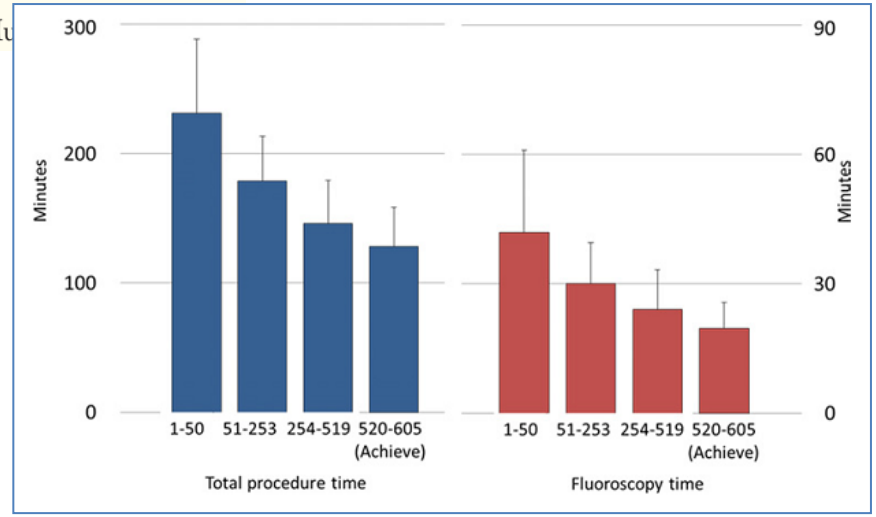
Long-Term Outcomes After Cryoballoon Pulmonary Vein Isolation

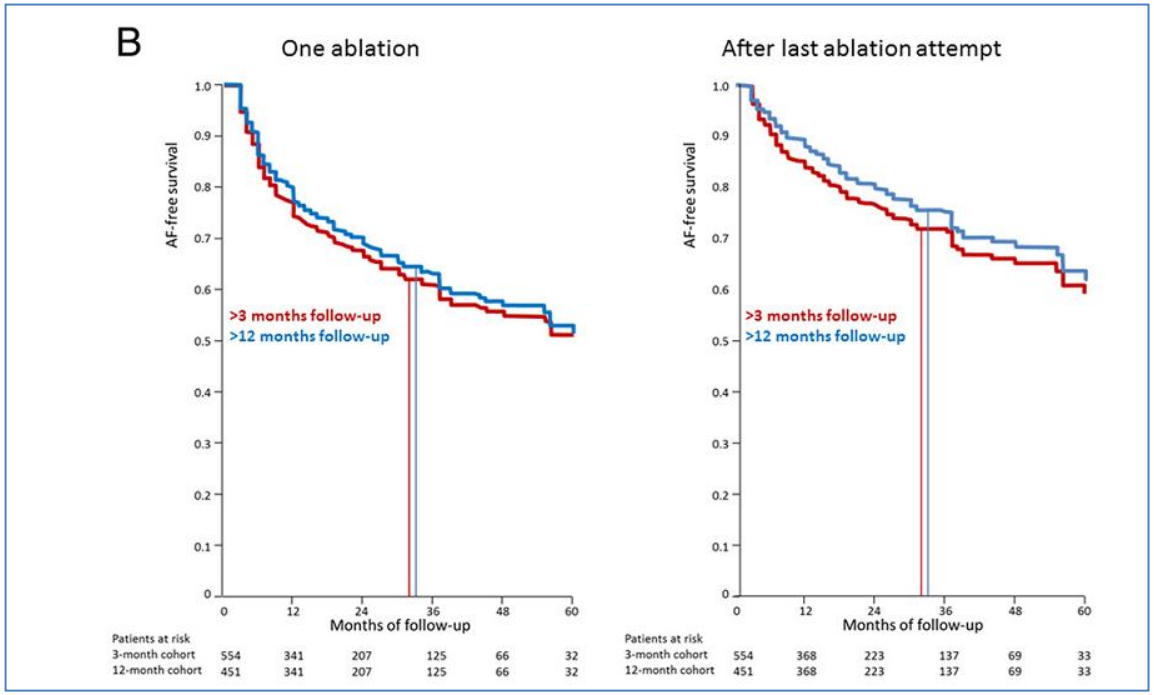
Results From a Prospective Study in 605 Patients

Jürgen Vogt, MD, Johannes Heintze, MD, Klaus J. Gutleben, MD, Bogdan Mu

Table 2 Procedure and Fluoroscopy Times With Different Balloons and 2 Balloons, Respectively, for Patients With Follow-Up Data After 3-Month Blanking Period (n = 553)*

Procedure	Total Procedure Time, Min	Fluoroscopy Time, Min
All procedures	156 (131–189)	25.2 (19.6–32.2)
23-mm balloon only	142 (116–177)	23.0 (18.1–29.1)
28-mm balloon only	152 (129–198)	25.1 (20.2–36.4)
2 balloons	165 (141–191)	26.5 (20.8–32.7)

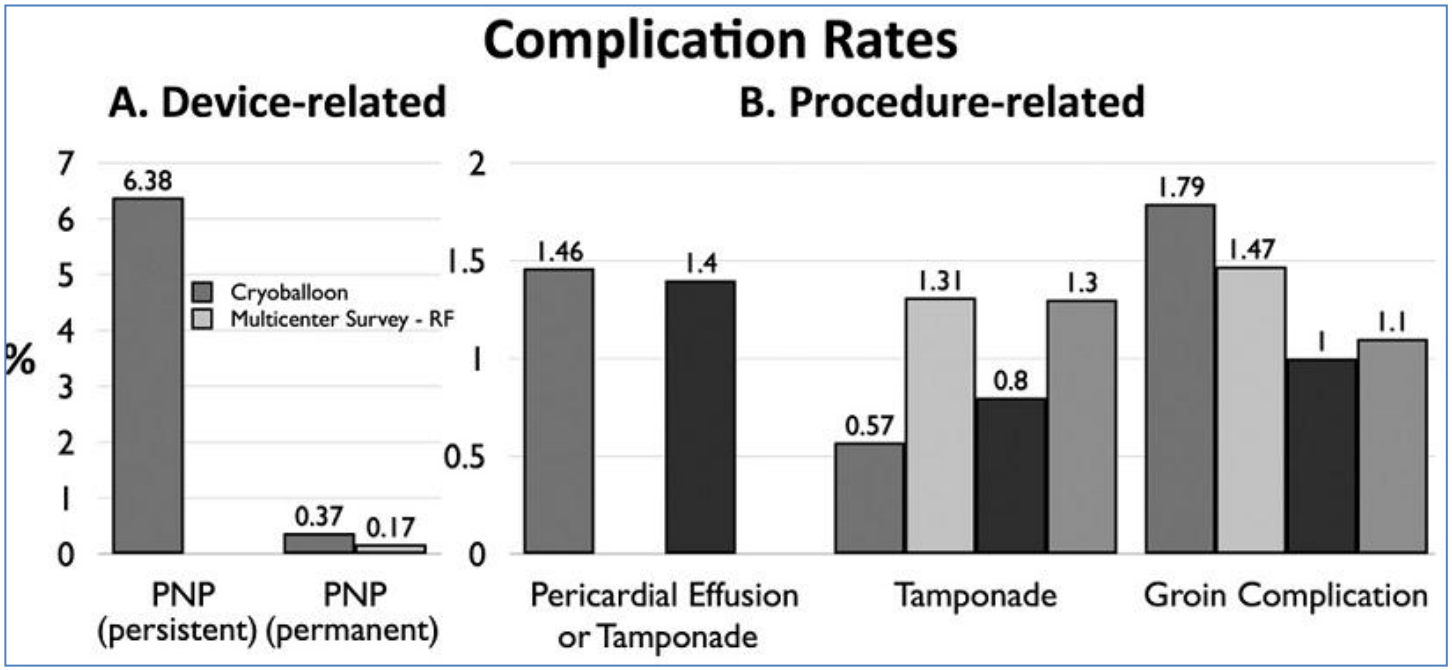


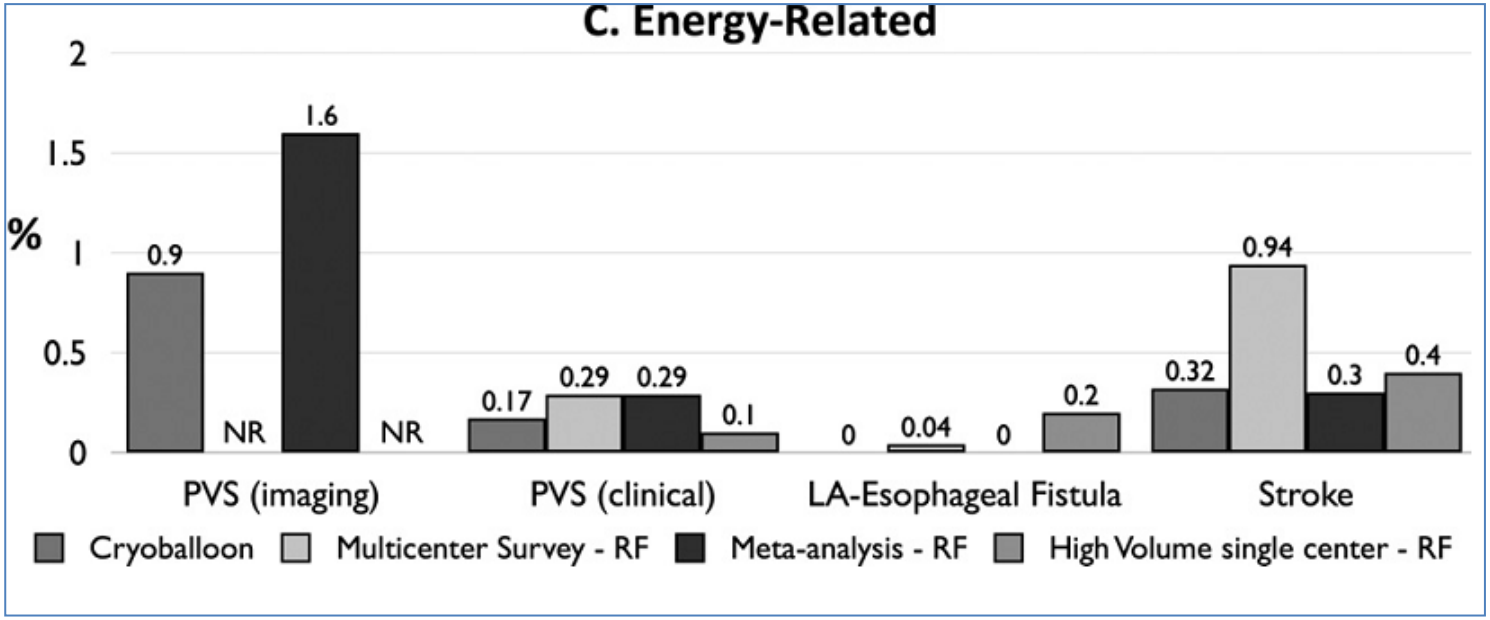


JACC Vol. 61, No. 16, 2013

Komplikasyonlar

- Frenik sinir paralizisi %4.7-%0.37
- Vasküler komplikasyonlar %1.8
- Kardiyak tamponad/effüzyon%1.5
- Tromboembolik komplikasyonlar %0.6
- Önemli pulmoner ven stenozu %0.2
- Vagal sinir hasarı, ösefagial dismotilite
- Atriyoösefagial fistül
- Ölüm (%0.1 RF verisi)

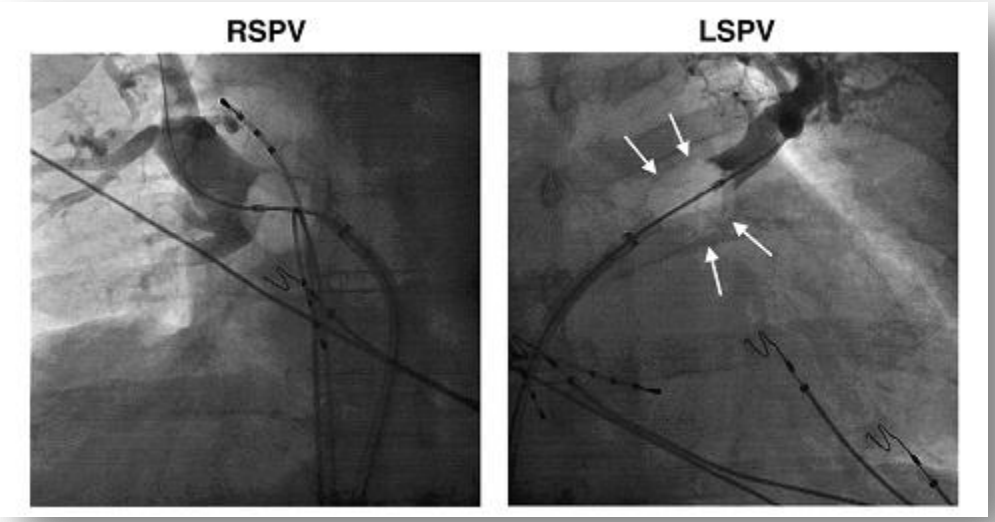


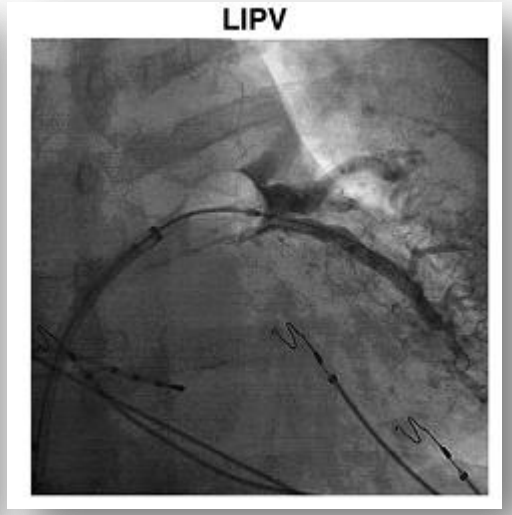


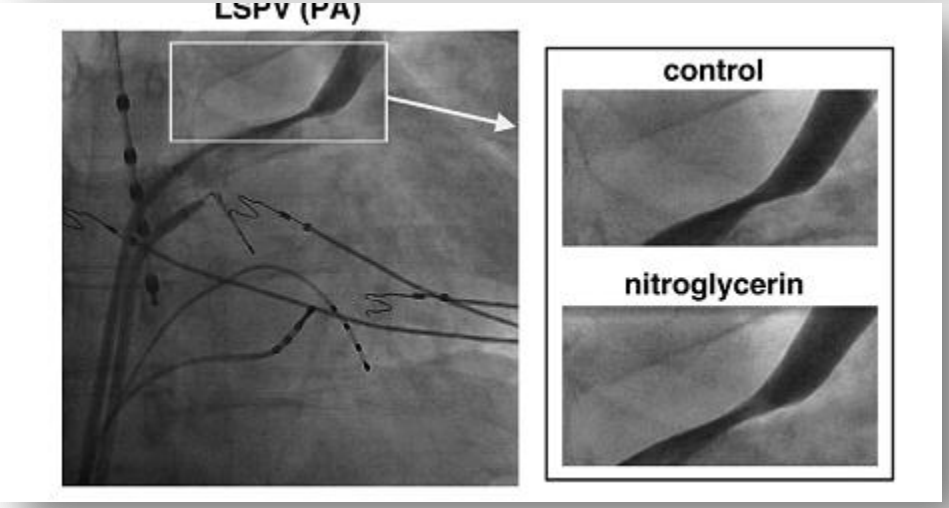
Heart Rhythm, Vol 8, No 9, September 2011

Asymptomatic pulmonary vein stenosis after cryoballoon catheter ablation of paroxysmal atrial fibrillation

Dierk Thomas, MD,* Hugo A. Katus, MD, Frederik Voss, MD[1]



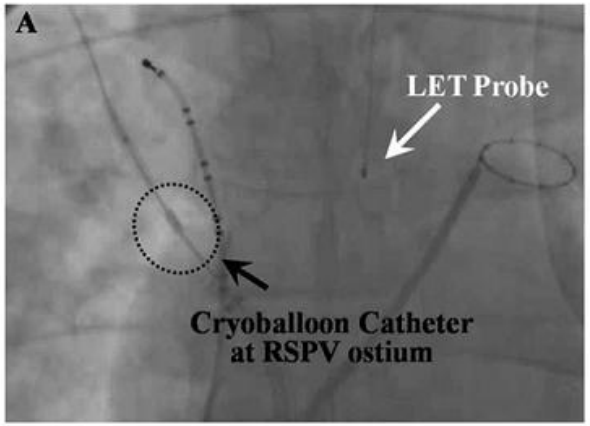


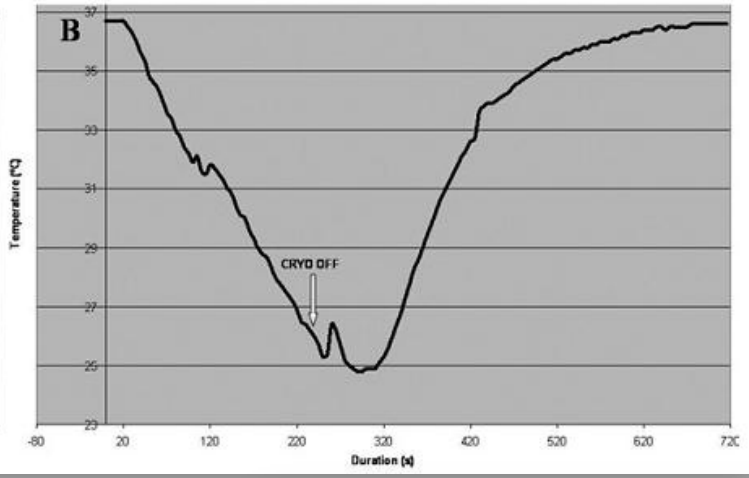


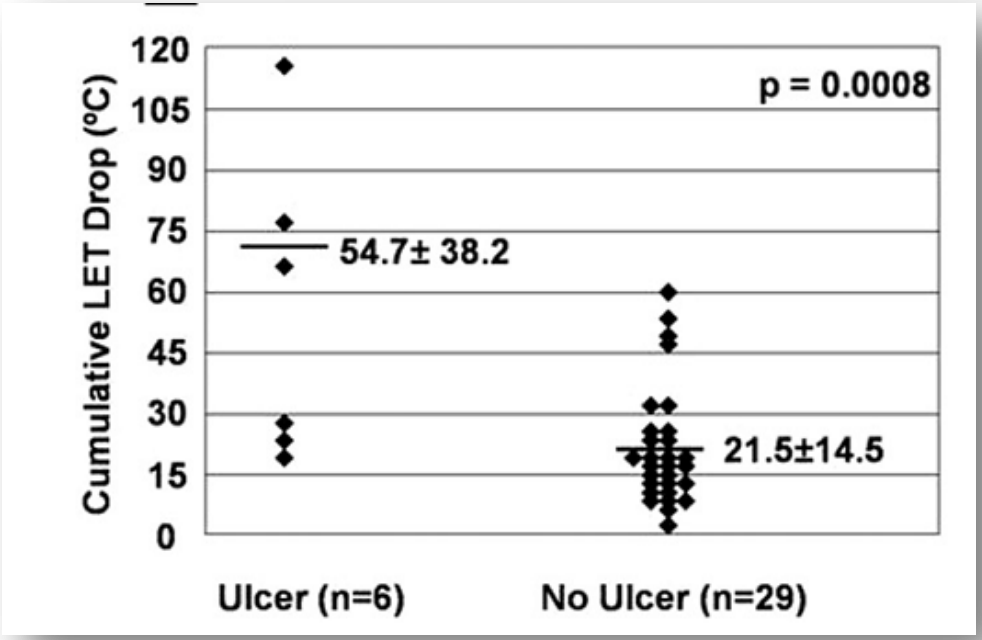
Journal of Electrocardiology 44 (2011)

The esophageal effects of cryoenergy during cryoablation for atrial fibrillation

Humera Ahmed, BA,* Petr Neuzil, MD, PhD,† Andre d'Avila, MD,* Yong-Mei Cha, MD,‡







Heart Rhythm, Vol 6, No 7, July 2009

Eylül 2010- Şubat 2012

- 1 yıllık takibi geçen 58 hasta
- 28 mm balon
- İşlem süresi 110.7±27.8 dk
- Floroskopi süresi 28.4±9.9 dk
- İlk vakalar ‘’Lasso’’ Katater
- ‘’Achieve’’ Katater sonraki vakalarda kullanıldı.

- 1 hastada kardiyak tamponad
- 2 hastada kendiliğinden gerileyen perikardiyal effüzyon
- 1 hastada sol atriyal-flutter
- 1 hastada prenik sinir paralizisi

Improved Procedural Efficacy of Pulmonary Vein Isolation Using the Novel Second-Generation Cryoballoon

ALEXANDER FÜRNKRANZ, M.D.,* STEFANO BORDIGNON, M.D.,* BORIS SCHMIDT, M.D.,*

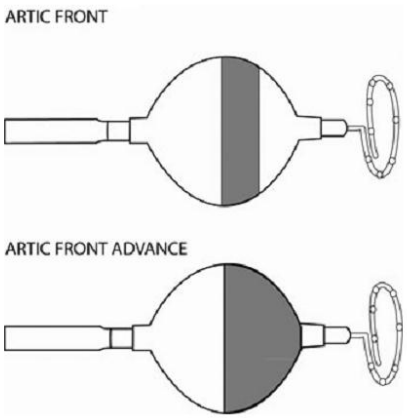


TABLE 2

Procedural Parameters

	CB-1G	CB-2G	P Value
Balloon applications per vein (excluding bonus)	1.8 ± 1.2	1,3 ± 0,8	<0.001
Distance to achieve proximal electrode (mm)	18 ± 8	12 ± 5	<0.001
T_{PVI} (seconds)	79 ± 60	52 ± 36	0.049
Procedure duration (minutes)	128 ± 27	98 ± 30	<0.001
Fluoroscopy exposure (minutes)	19.5 ± 7.4	13,4 ± 5,3	0.001
Contrast medium (mL)	134 ± 33	120 ± 34	n.s.

TABLE 3

Frequency of Single-Shot PVI and Real-Time PVI Visualization

	Single- Shot PVI			Real-Time PVI Visualization		
	CB-1G	CB-2G	P	CB-1G	CB-2G	P
LSPV	60%	77%	n.s.	57%	81%	0.054
LIPV	60%	100%	<0.001	57%	81%	0.054
LCPV	–	75%	–	–	25%	–
RSPV	37%	80%	0.001	53%	90%	0.002
RIPV	47%	80%	0.007	30%	60%	0,02
Overall	51%	84%	<0.001	49%	76%	<0.001

TABLE 4

Minimum Balloon and Esophageal Temperatures

	Min. Balloon-Temperature (°C)			Min. LET (°C)
	CB-1G	CB-2G	P	CB-2G
LSPV	−52 ± 5	−52 ± 6	n.s.	27 ± 9 (range 9–35)
LIPV	−48 ± 6	−48 ± 6	n.s.	30 ± 6 (range 17–35)
LCPV	–	−58 ± 3	–	20 ± 16 (range 2–34)
RSPV	−52 ± 6	−54 ± 7	n.s.	32 ± 3 (range 24–35)
RIPV	−44 ± 5	−50 ± 5	<0,001	26 ± 10 (range 4–35)
Overall	−49 ± 6	−52 ± 6	0,005	29 ± 8 (range 2–35)

Journal of Cardiovascular Electrophysiology

Teşekkürler…