



11. Atriyal Fibrilasyon Zirvesi 2022

9 - 10 Aralık 2022 • Spice Kongre Merkezi, Antalya



Persistan AF de Cryobalon ve Nonpulmoner Ven

Odakların Cryobalon ile Ablasyonu

Dr. Mevlüt Koç

Saęlık Bilimleri Üniversitesi

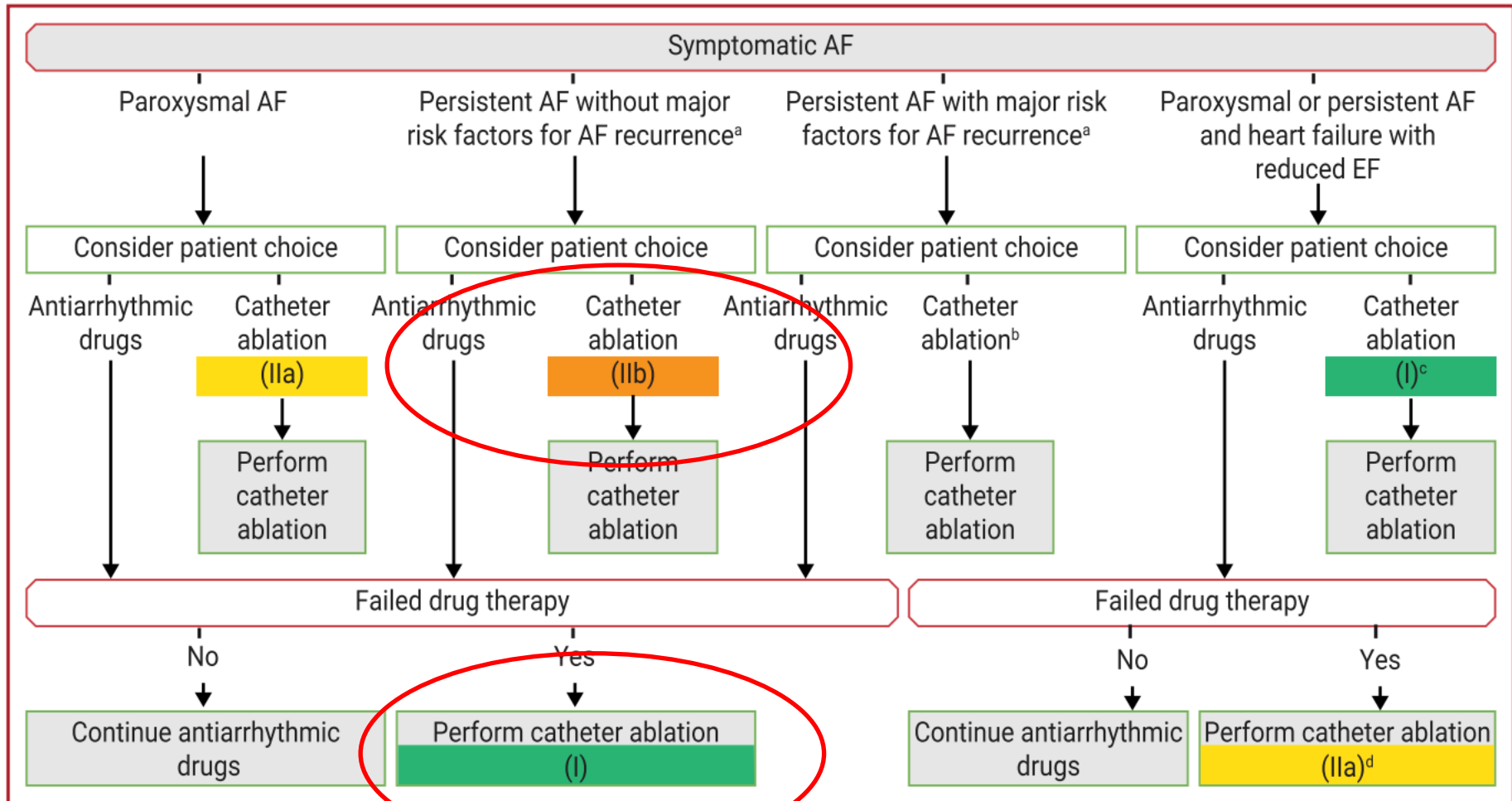
Adana Şehir Hastanesi



Sunum Akışı



- **Persistan AF ablasyonunda kılavuz ve güncel öneriler**
- **Persistan AF kriyobalon ve RF ablasyon sonuçları farklı mı ?**
- **İlk aşama PV izolasyonu, peki sonrası (Lineer, CFAE, LAPW...)**
- **PV dışı AF odağının sıklığı nedir ? PV dışı odaklar nerededir ?**
- **Güncel PV dışı odaklarının kriyobalon ile ablasyon sonuçları**
- **Persistan AF de kriyobalon uyguladığımız bir olgu sunumu**



Persistan AF ablasyonu güncel öneriler



- **Semptomatik AF kateter ablasyon anti-aritmik tedaviden daha etkin**
- Hem paroksizmal hem de persistan AF' de antral PVI ilk seçenek tedavi
- 3D RF kaynaklı AF ablasyonu altın standart
- Özellikle paroksizmal AF kriyobalon ile AF ablasyonu en önemli alternatif
- Yapılan son çalışmalarda persistan AF ablasyonunda RF ve kriyobalon ablasyonunda benzer sonuç

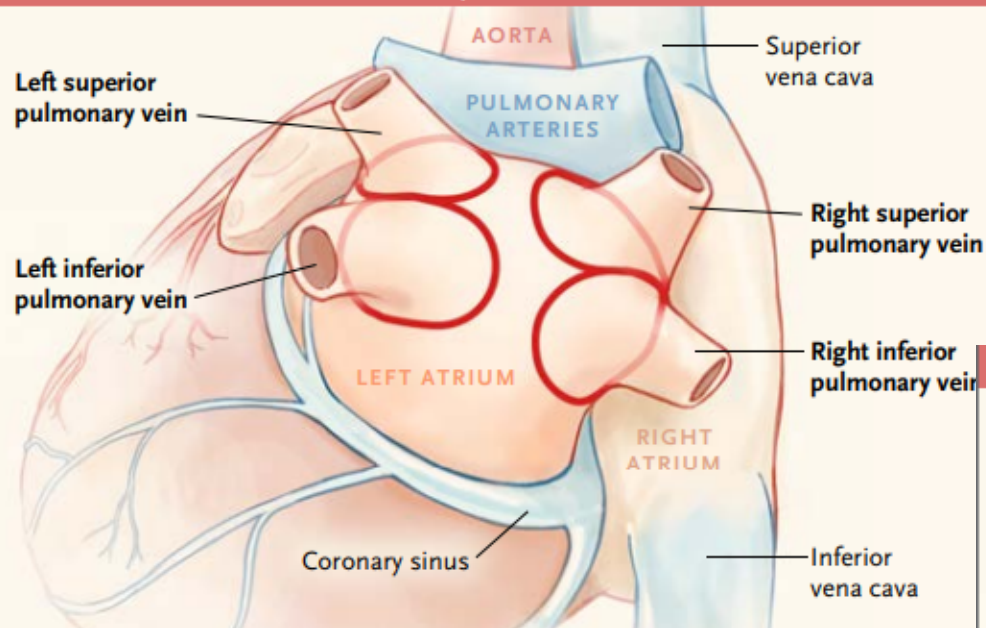
İlk hedef pulmoner ven izalasyonu (PVI)

Europace . 2017 Mar 1;19(3):378-384

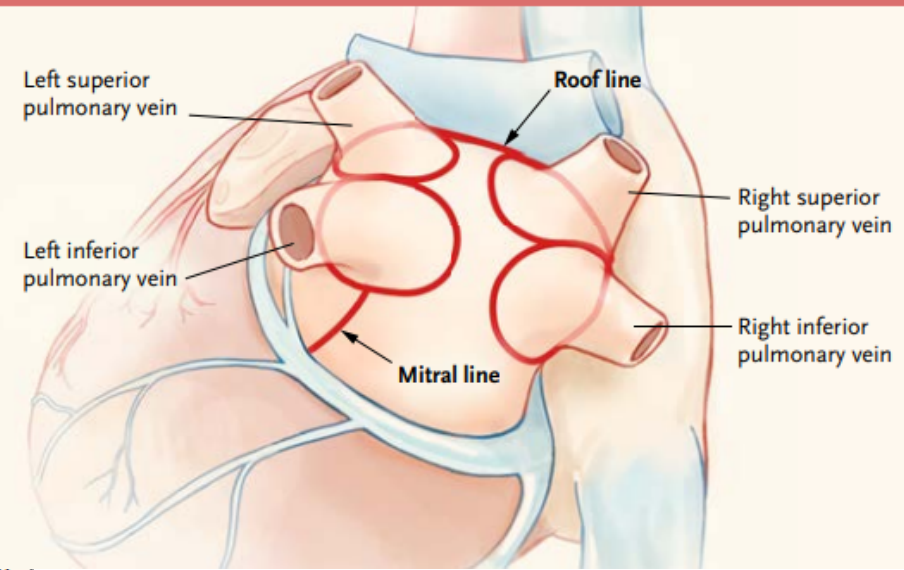
Cardiol Ther. 2020 Jan 2. doi: 10.1007/s40119-019-00158-2.

JICE 2022 Sep 12. doi: 10.1007/s10840-022-01369-9.

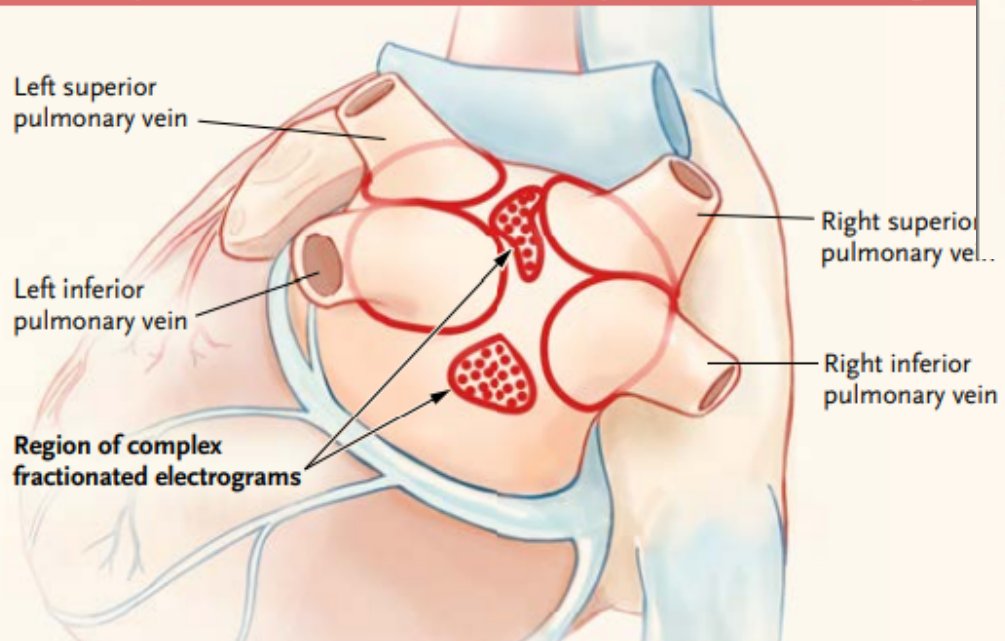
Pulmonary-vein isolation

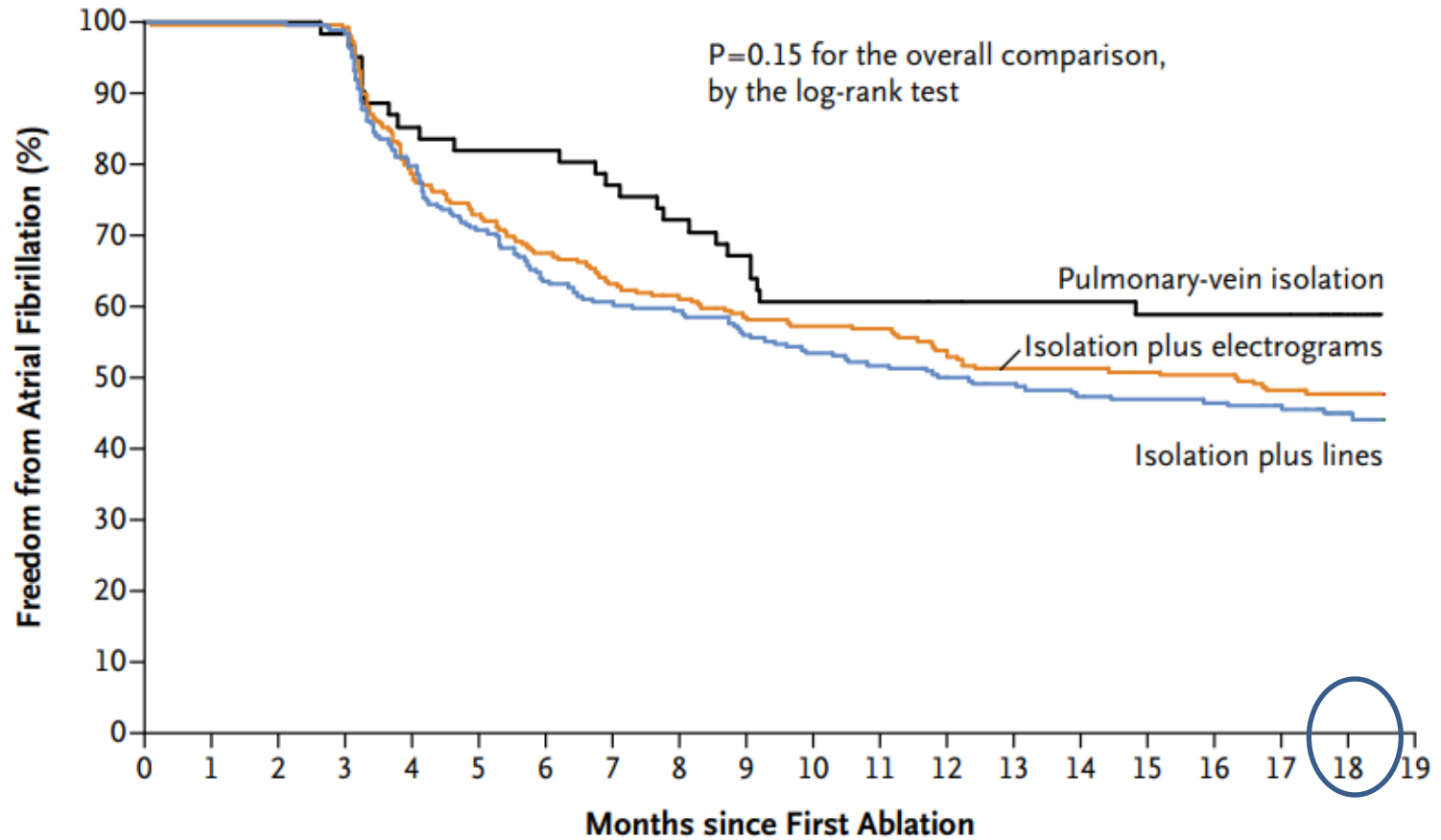


Pulmonary-vein isolation with additional linear ablation



Pulmonary-vein isolation with ablation of complex fractionated electrograms





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

AF ablasyonunda ilk aşama PVI ya sonra ?

İlk AF ablasyonunda kompleks ablasyon protokolü önerilmemekte

- Pulmoner venler AF ana tetikleyicisi
- Sadece antral PVI medikal tedaviye göre etkili
- Paroksizmal ve persistan AF PVI ek olarak yapılan diğer ablasyon başarısı yok
- Alster-Lost-AF trial; Persistan ve long-standing persistan AF
 - PVI
 - PVI + CFAEs
 - PVI + Lineer lezyon
- Benzer çalışma ve sonuç Persistan AF hastalarında CHASE AF çalışması
- En son olarak yapılan STAR AF 2 çalışmasında da benzer hastalarda sonuç gösterilmiştir

12 ay sonunda atrial taşiaritmi bakımından benzer sonuç

**İlk PVI yaptık nüks oldu, PV izole ise artık ikinci ablasyon yerleri aranmalı
CFAEs ve lineer lezyon**

AF PV dışında bir yerden kaynaklanıyor ise bu bölgenin ablasyon Sınıf IIa Kanıt düzeyi C

LAPW ablasyon persistan ve LS persitan AF Sınıf IIb Kanıt düzeyi C

Yüksek doz isoproterenol ile non-PV odak tespit ve ablasyonu Sınıf IIb ve Kanıt düzeyi C

Linear ve CFAE ablasyonu için yeterli kanıt yok Sınıf IIb Kanıt düzeyi C

Techniques and technologies

Complete electrical isolation of the pulmonary veins is recommended during all AF catheter-ablation procedures. ^{235–237,239,606,608–610,613,614,678,679,681,683,684,686,713,731,759,780}

I

A

If patient has history of CTI-dependent AFL or if typical AFL is induced at the time of AF ablation, delivery of a CTI lesion may be considered. ^{731–733,819–821}

IIb

B

Use of additional ablation lesions beyond PVI (low voltage areas, lines, fragmented activity, ectopic foci, rotors, and others) may be considered but is not well established. ^{677,680,708,711–730}

IIb

B

İsoproterenol ile sorumlu yeri tespit edilmesi

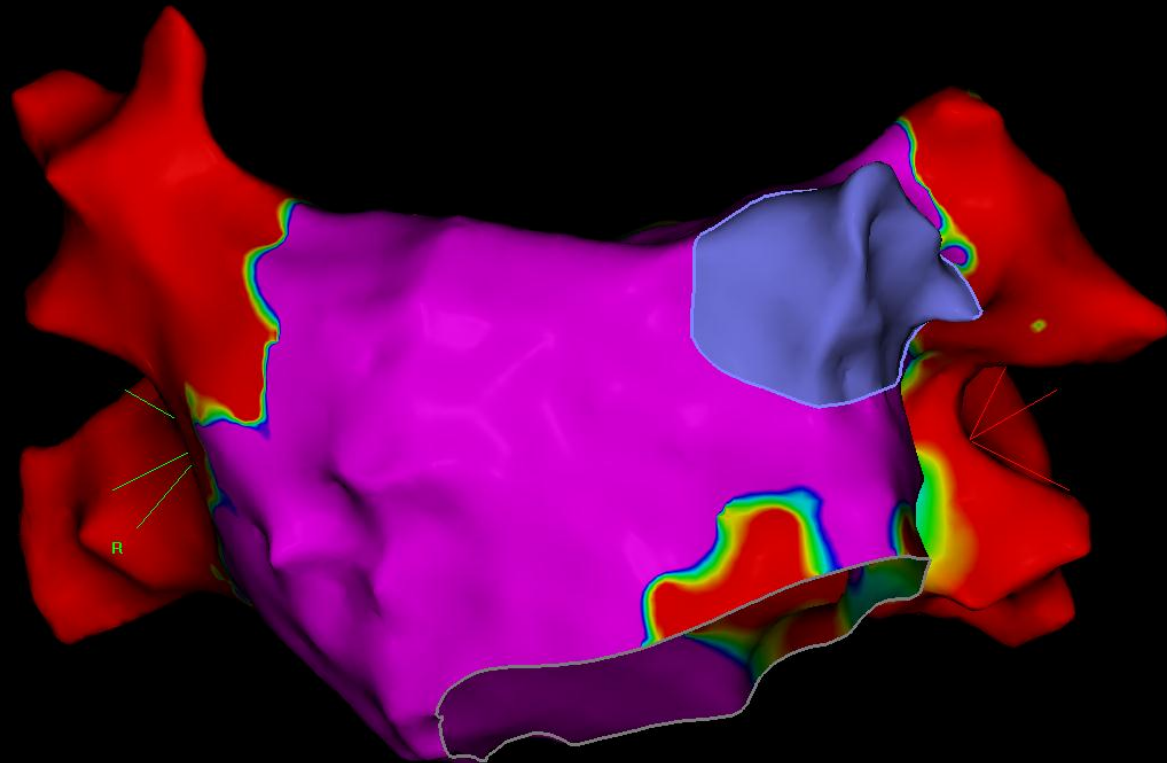


Interatrial septum kaynaklı AF

0.20 mV BI 0.50 mV



2-Map (0, 0) Resp



R

1.32



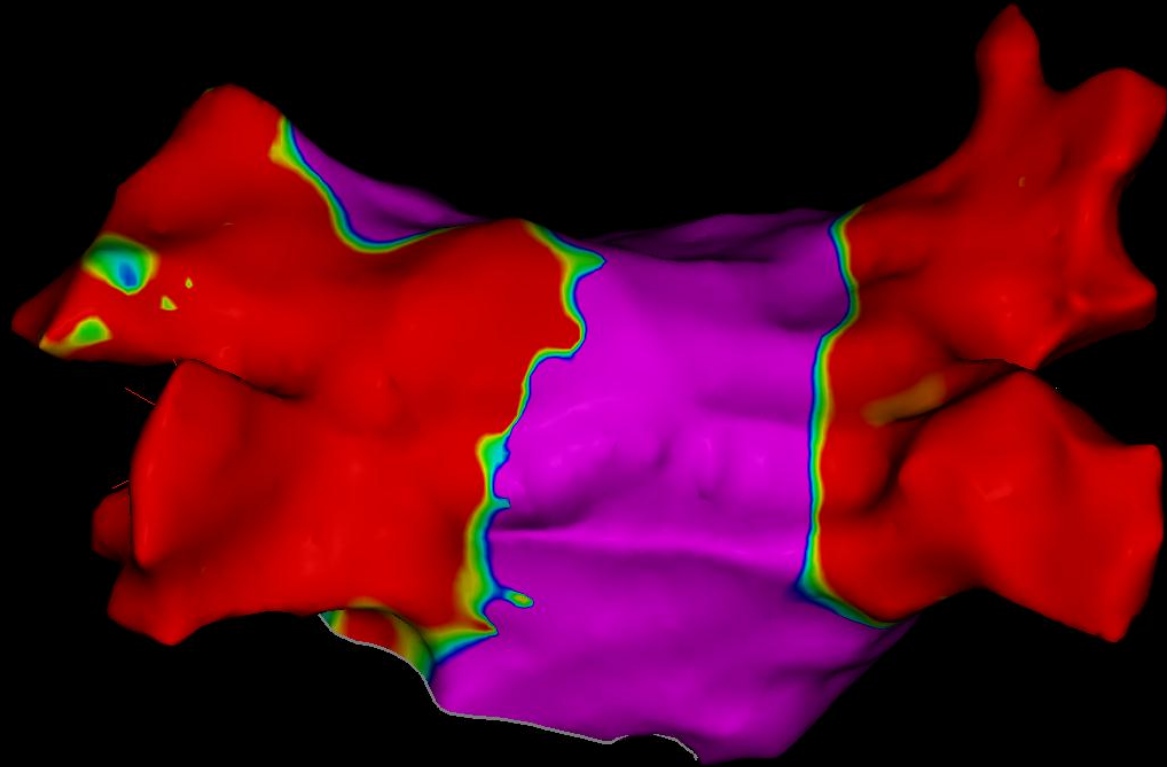
0% [slider]

AP PA LAO RAO LL RL INF SUP

Interatrial septum kaynaklı AF

0.20 mV BI 0.50 mV

2-Map (0, 0) Resp

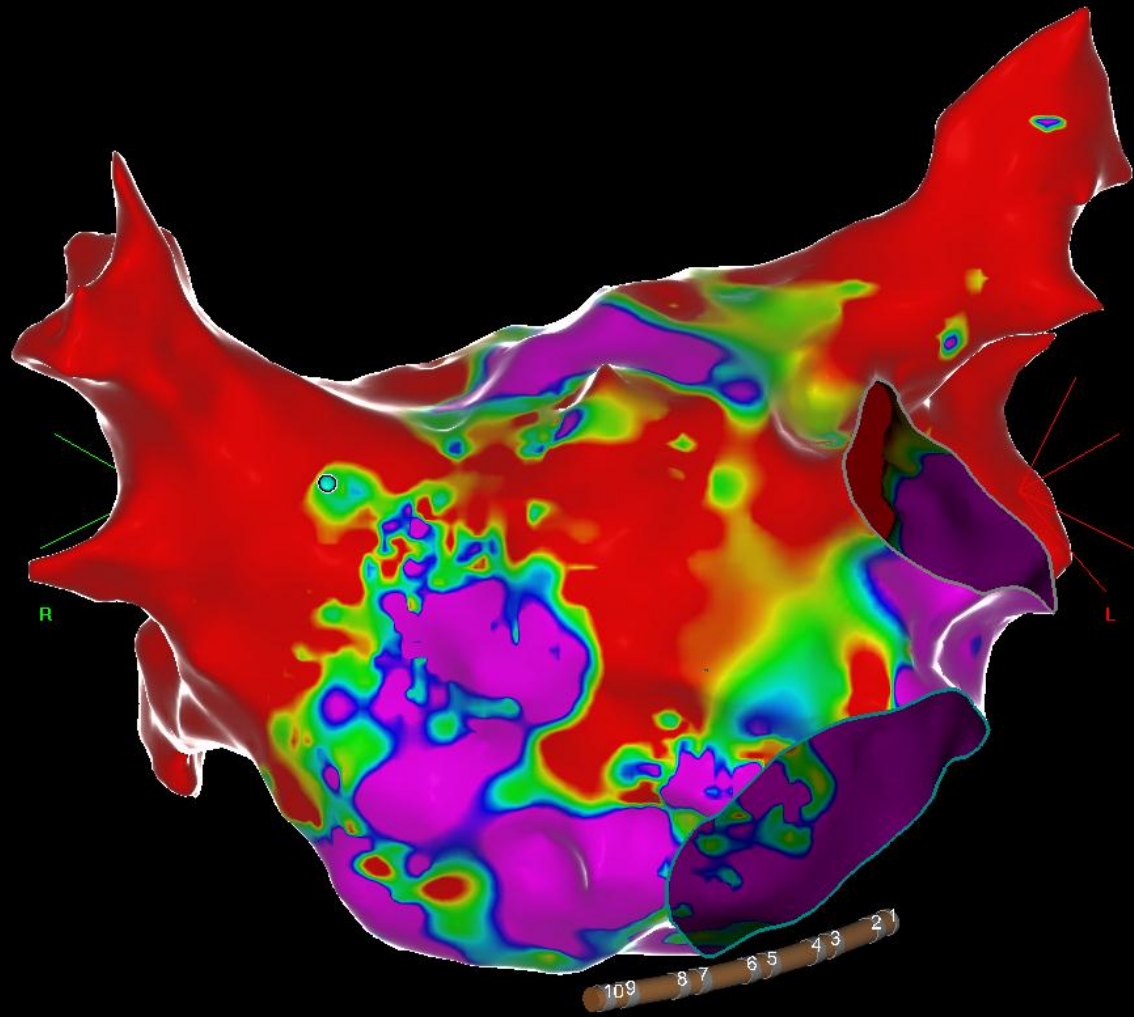
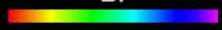


1.32



0% [slider]

AP PA LAO RAO LL RL INF SUP



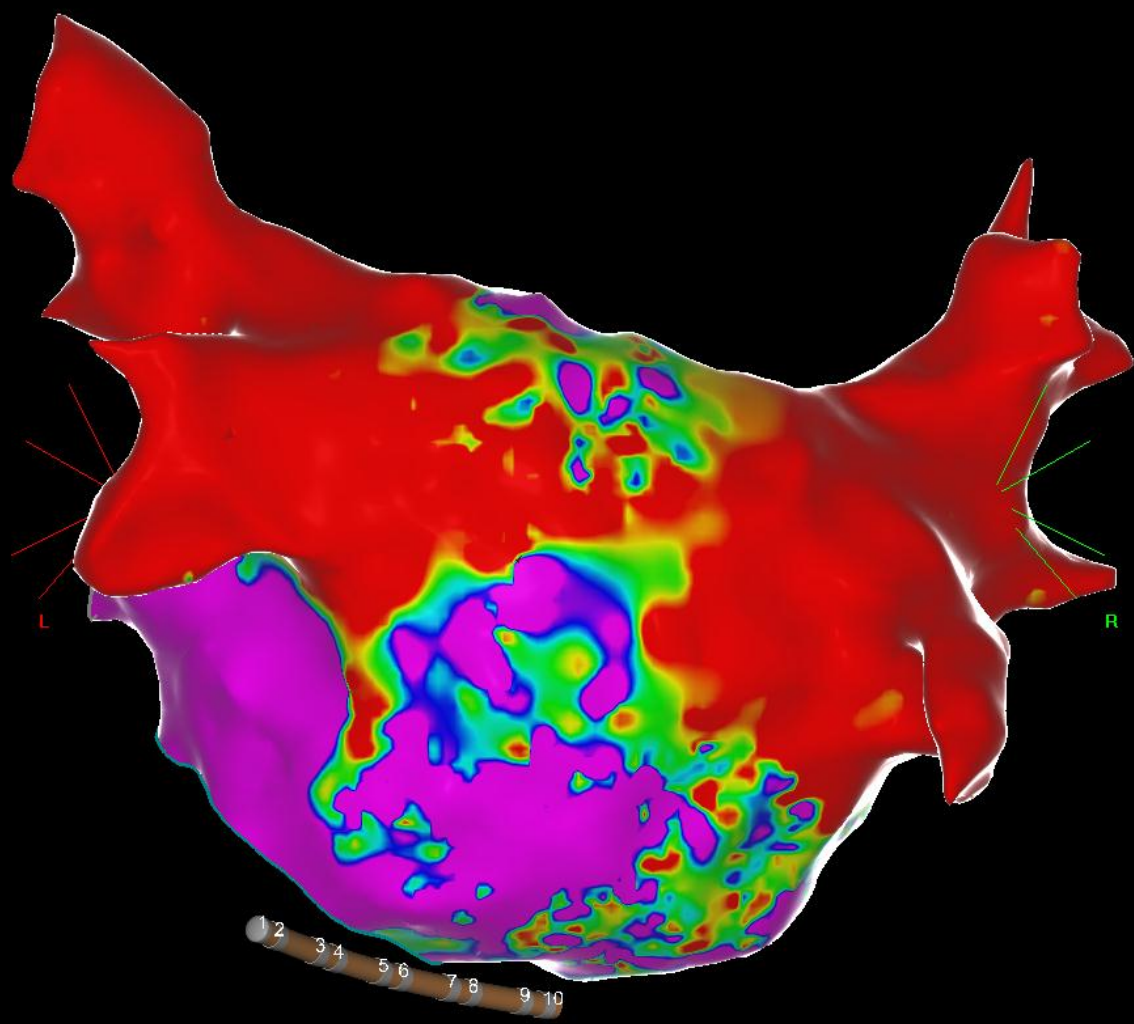
1.39



0% = - +

AP PA LAO RAO LL RL INF SUP





1 2 3 4 5 6 7 8 9 10

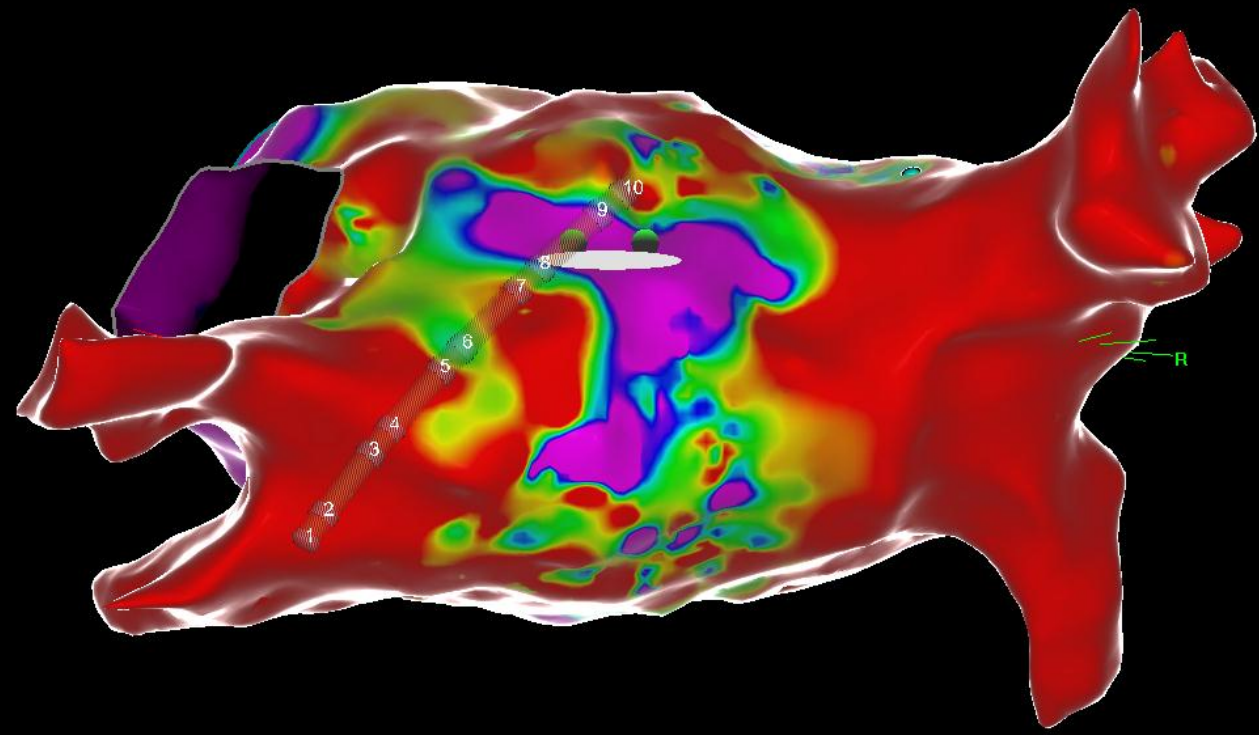
1.39



0% 1.39

AP PA LAO RAO LL RL INF SUP





1.27



0% [slider]

AP PA LAO RAO LL RL INF SUP



1-Map (1728, 0) Resp

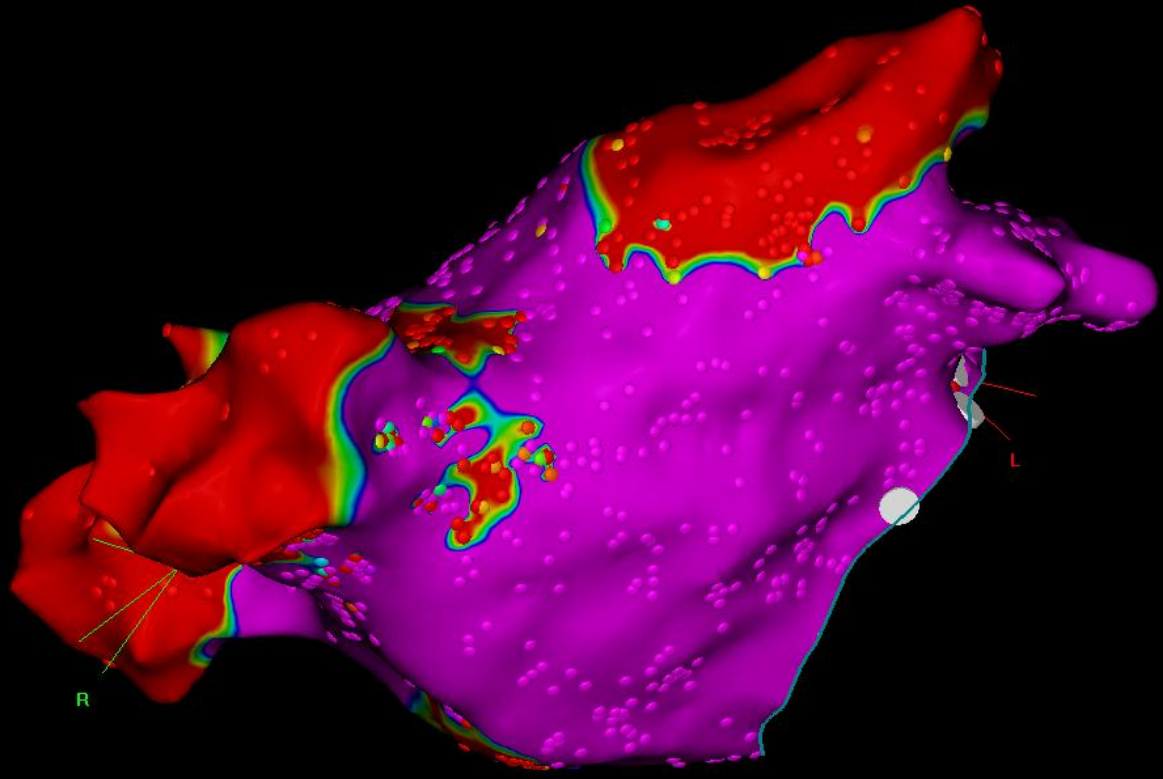
0.20 mV Bi 0.50 mV



69 gs FTI 712 gs



T.Time



R

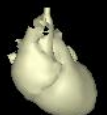
L

Preset

-
-
-
-
-
-
-
-
- All

17

1.42



0%

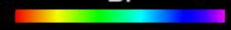


AP PA LAO RAO LL RL INF SUP

1-Map (1728, 0) Resp



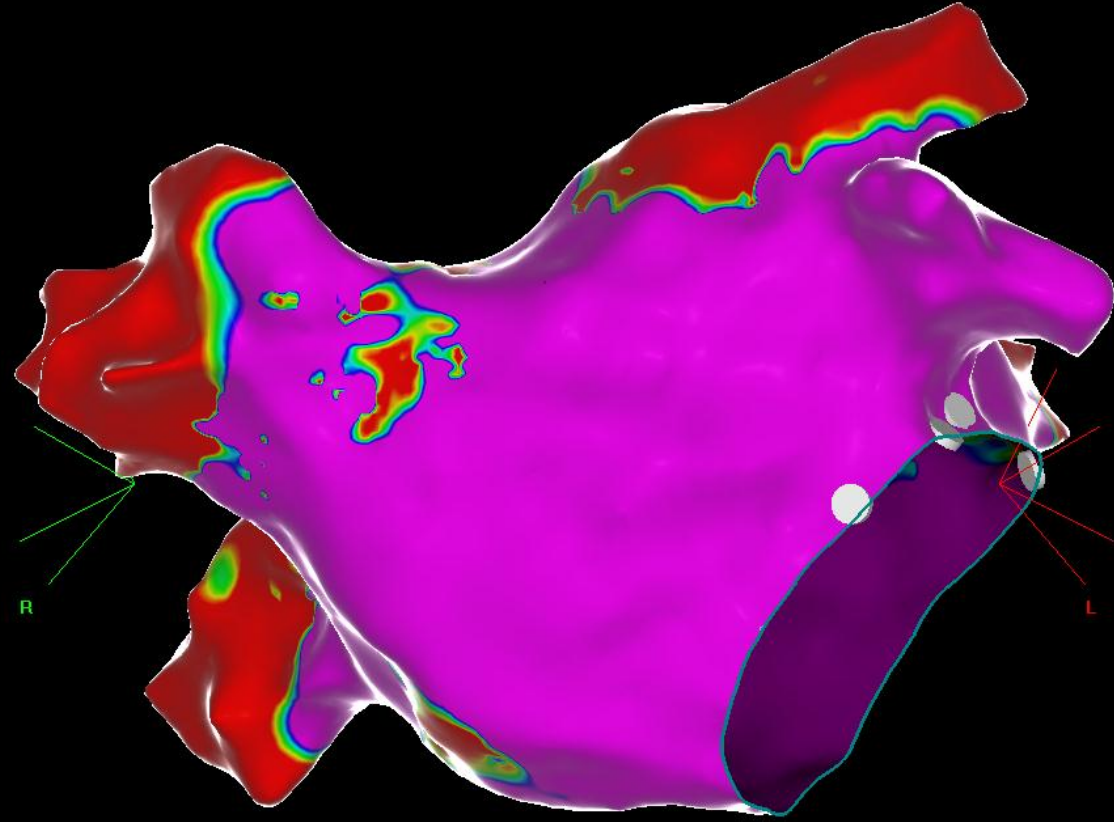
0.20 mV Bi 0.50 mV



69 gs FTI 712 gs



T.Time



Preset

-
-
-
-
-
-
-
-
- All



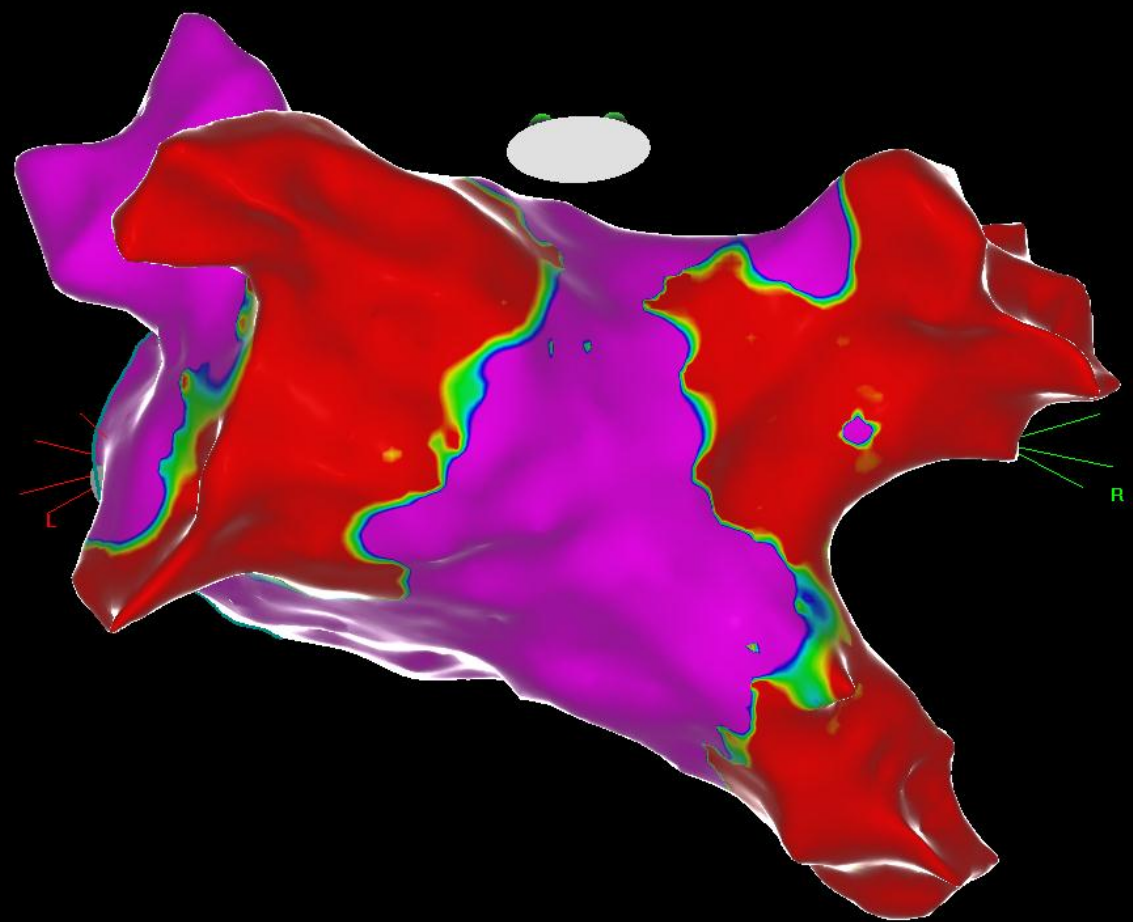
17

1.42



0%

AP PA LAO RAO LL RL INF SUP



Preset

-
-
-
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-
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-
- All

17

1.42

+

-

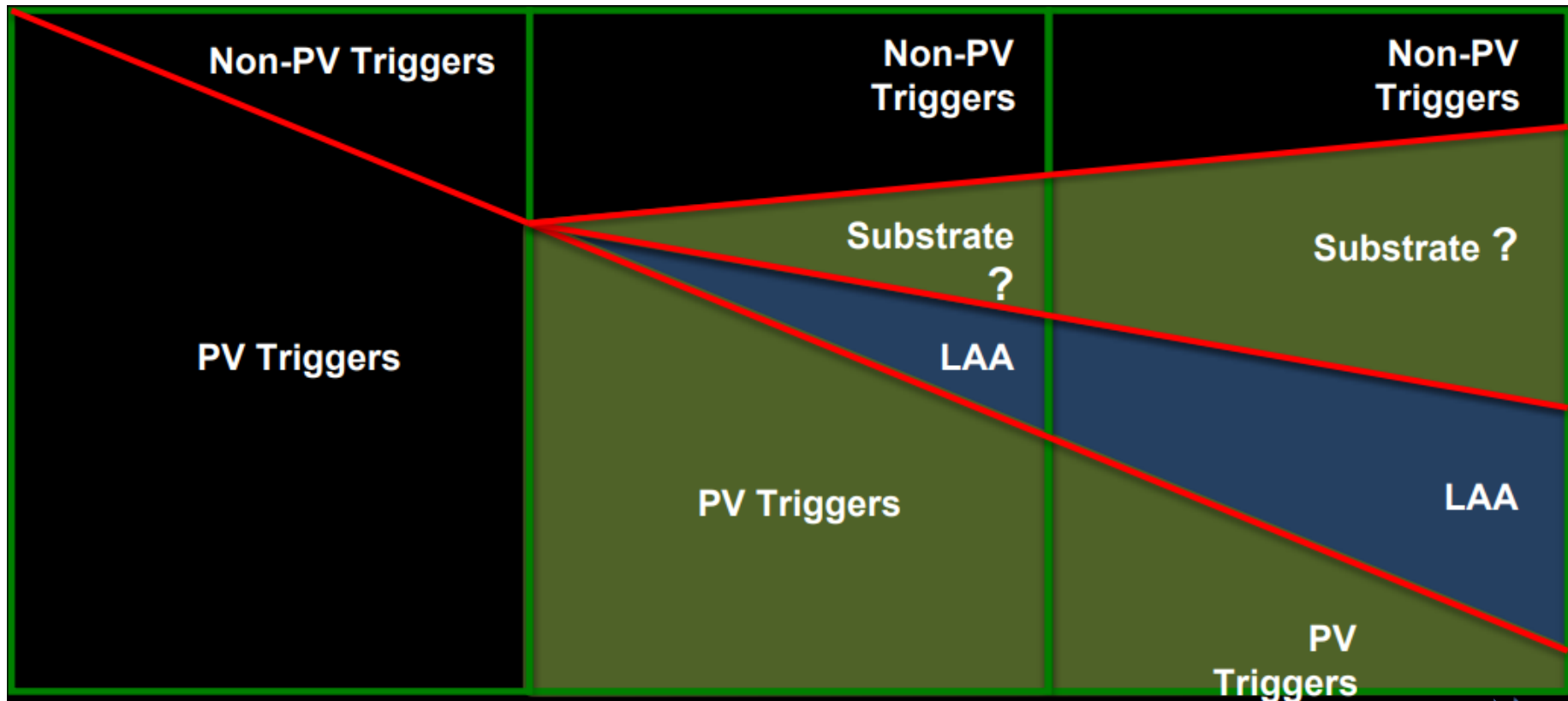
+

-

0%

+

-



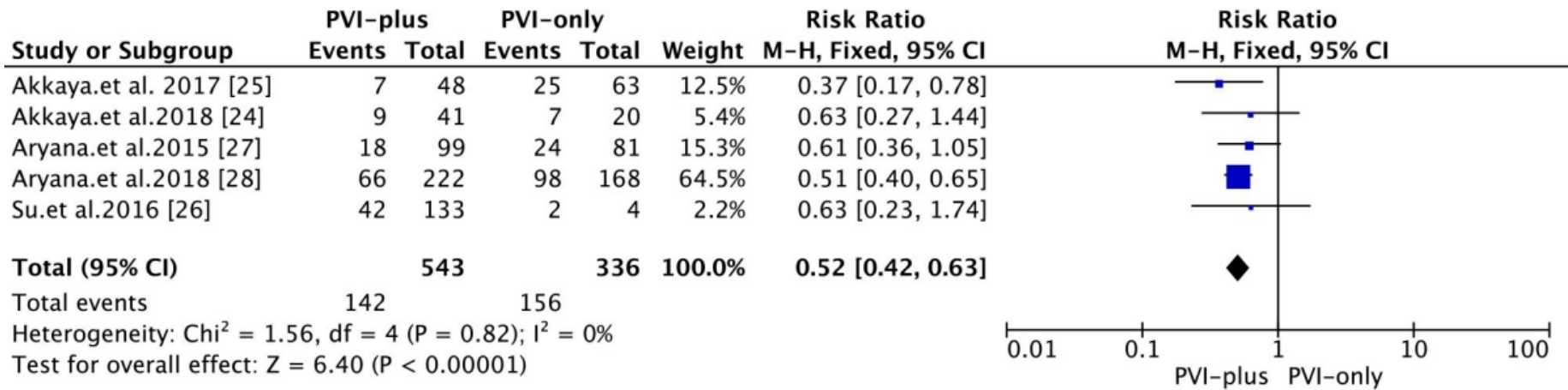
Paroksismal

Persistan

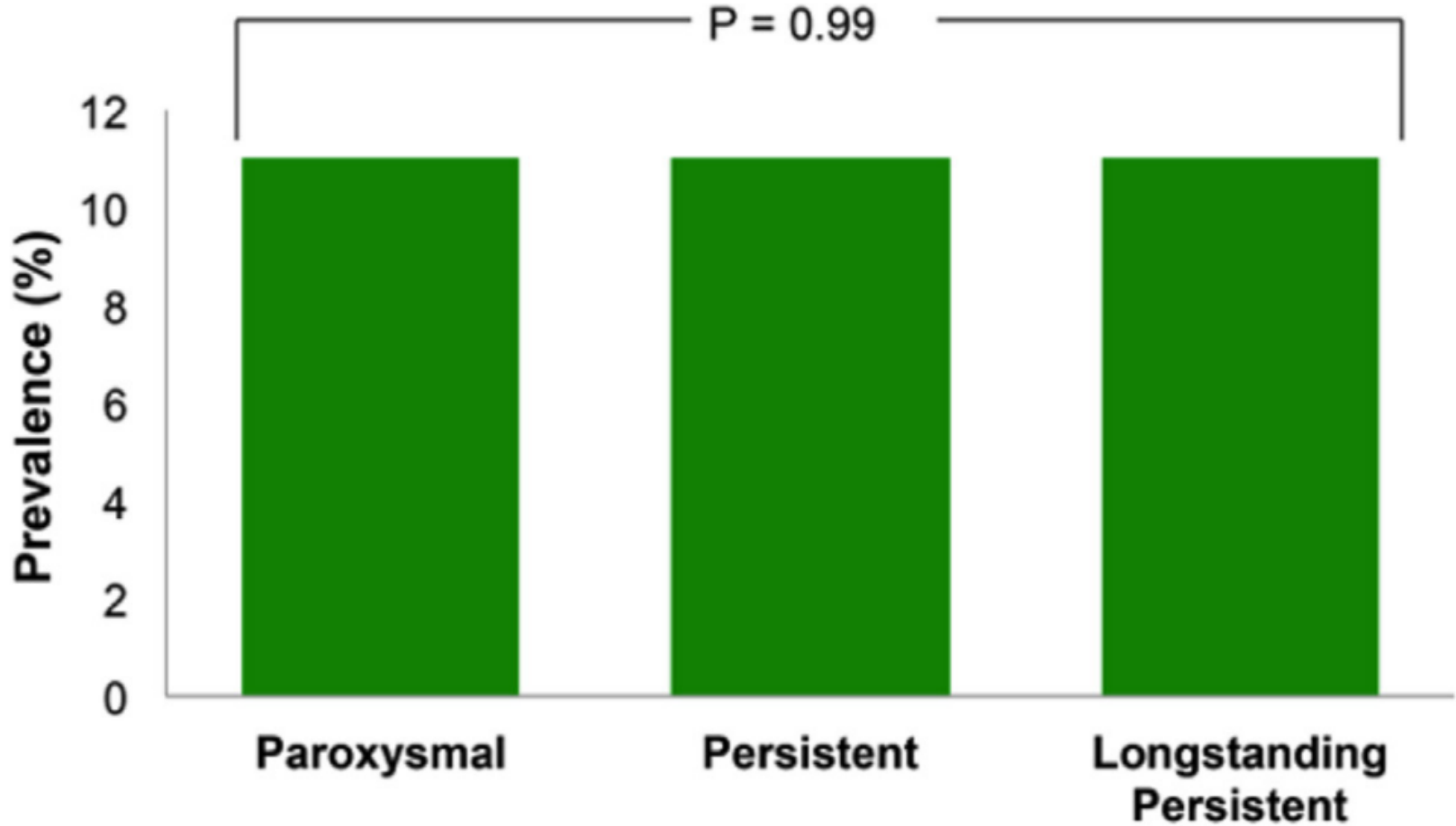
Long-standing persistan

Persistan AF de Kriyobalon ile PVI-only ve PVI-plus Meta-analiz %53.2 vs %73.2

Study	Ablation strategy	Freezing protocol	Procedure times (minutes)	Fluoroscopy time (minutes)	Intra ECV (n)
Akkaya et al. ^[24] 2017	PVI+ roof line + CIA	Each PV freezing cycle lasted 180 s + a bonus freeze of 150~180 s	120 (102 of 147)	20 (16 of 27)	36
Akkaya et al. ^[25] 2017	PVI + roof line+ CIA	Each PV freezing cycle lasted 180 s + a bonus freeze of 240 s	102 (79/120)	16 (12/24)	40
Su et al. ^[26] 2016	PVI + roof line+ substrate modification	Each PV freezing cycle lasted 180 s + a bonus freeze of 180 s	13200B136	4.2± 2.2	Not reported
Aryana et al. ^[27] 2015	PVI + non-PV triggers	1~3 Freezes to each PV, each between 120 and 360 s	145 ± 49	29 ± 13	Not reported
Aryana et al. ^[28] 2018	PVI+PWI	1~2 Freezes to each PV, each between 120~180 s.	188 ± 42	28 ± 9	178

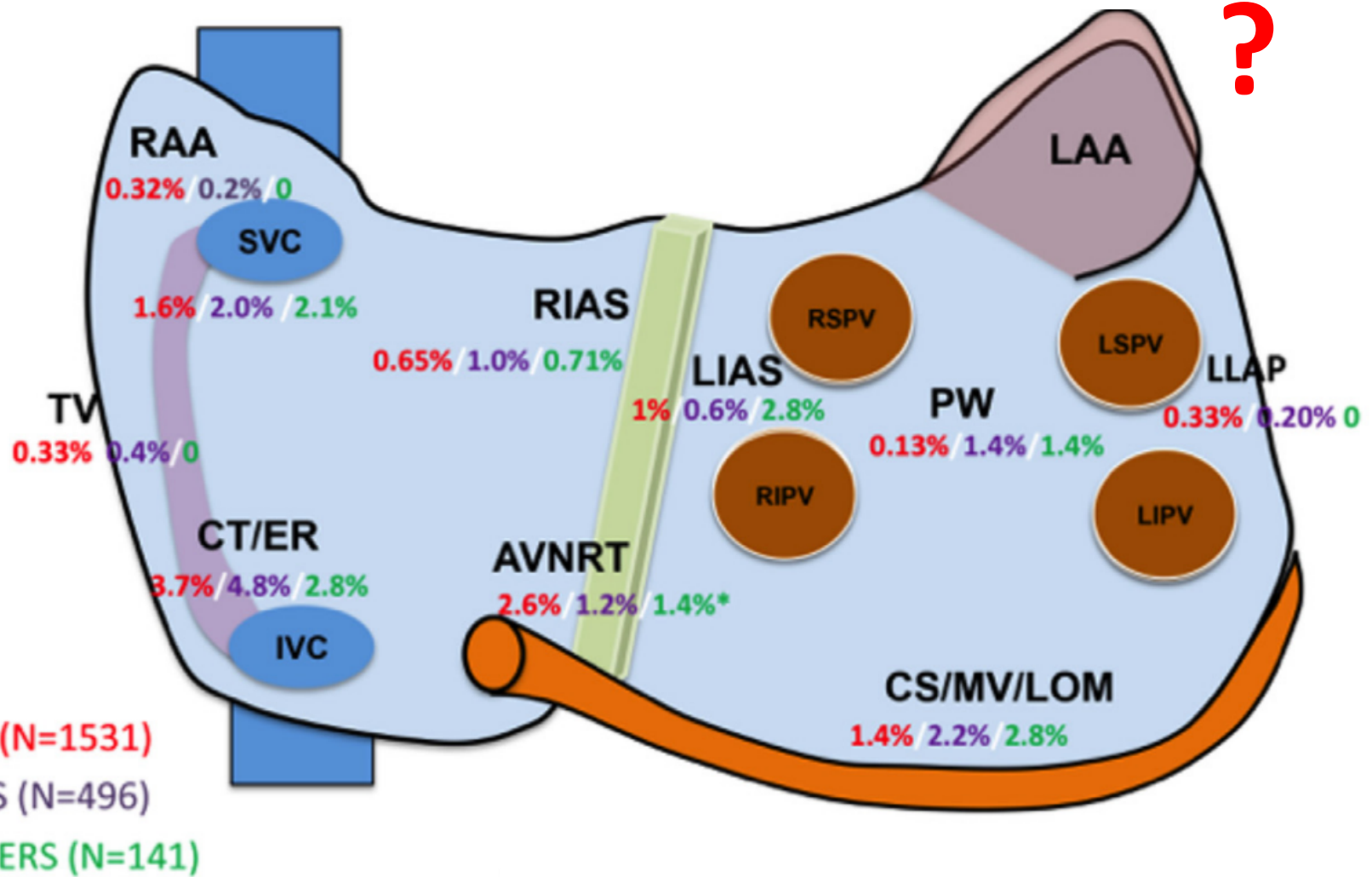


Farklı AF tiplerinde PV dışı tetikleyici yerlerinin sıklığı



2168 AF hastasında isoproterenol ile PV dışı odak sıklığı %11
SVT, AVRT, AVNRT sıklığı %4

Farklı AF tiplerinde non-PV tetikleyici yerlerinin prevelansı



Left atrial appendage: an underrecognized trigger site of atrial fibrillation

Luigi Di Biase¹, J David Burkhardt, Prasant Mohanty, Javier Sanchez, Sanghamitra Mohanty,

987 AF hastasında isoproterenol ile non-PV triger %27 LAA

Randomized Controlled Trial > J Am Coll Cardiol. 2016 Nov 1;68(18):1929-1940.

doi: 10.1016/j.jacc.2016.07.770.

Left Atrial Appendage Isolation in Patients With Longstanding Persistent AF Undergoing Catheter Ablation: BELIEF Trial

AF ablasyon başarısı geniş ablasyon ve LAA: %44 vs %72

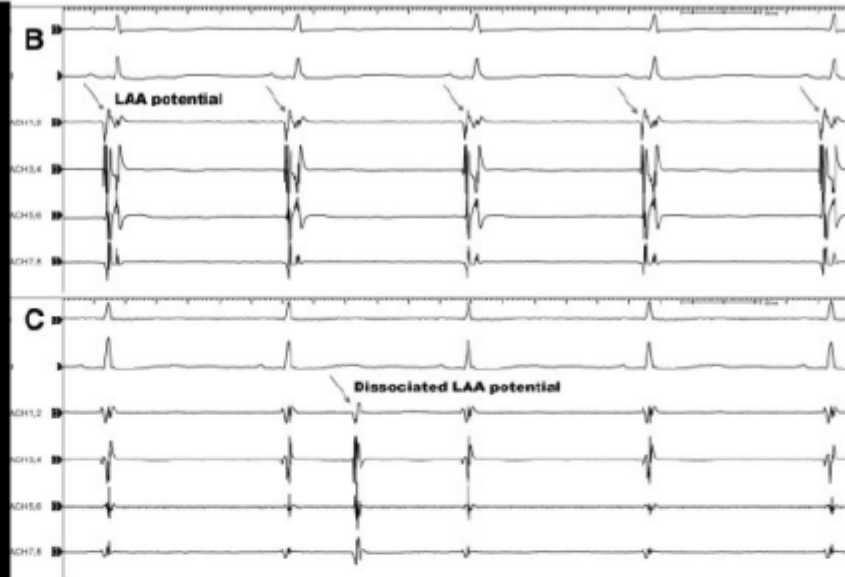
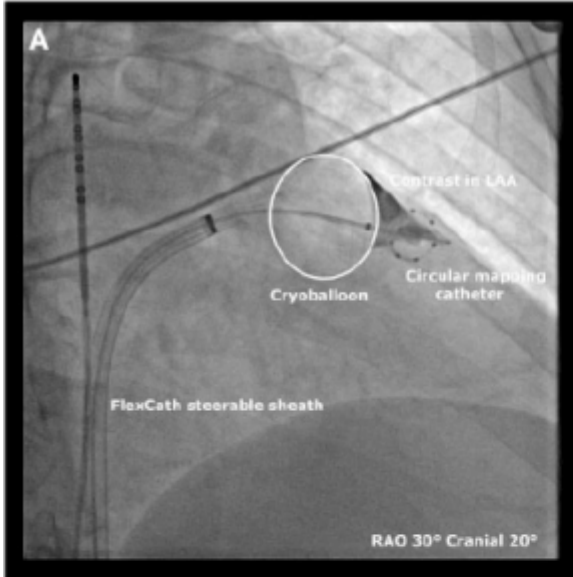
Left atrial appendage isolation in addition to pulmonary vein isolation in persistent atrial fibrillation: one-year clinical outcome after cryoballoon-based ablation.

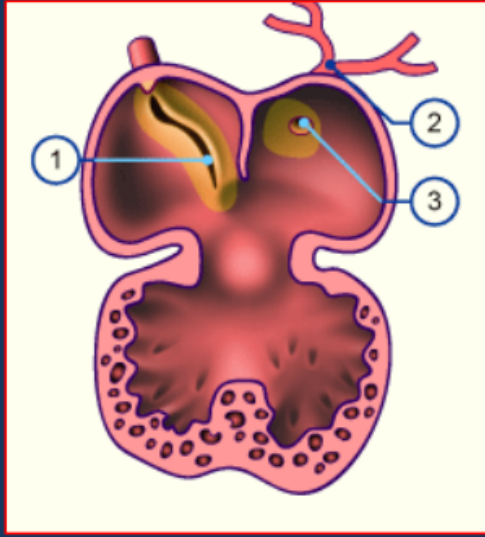
Yorgun H, Canpolat U, Kocyigit D, Çöteli C, Evranos B, Aytemir K.

Europace. 2017 May 1;19(5):758-768. doi: 10.1093/europace/eux005.

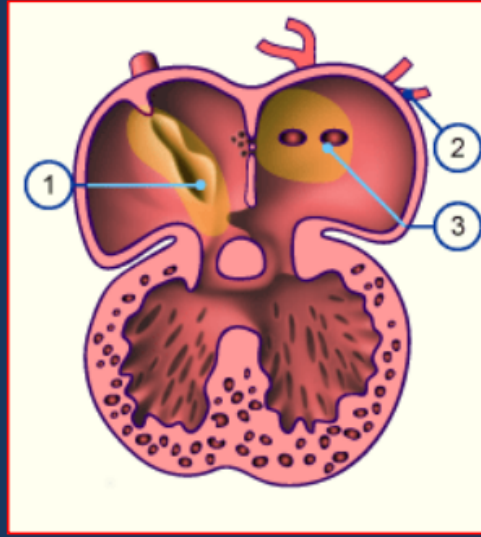
AF ablasyon başarısı PVI ile %67, PVI ek LAA izolasyonu %86

Circulation . 2010 Jul 13;122(2):109-18.

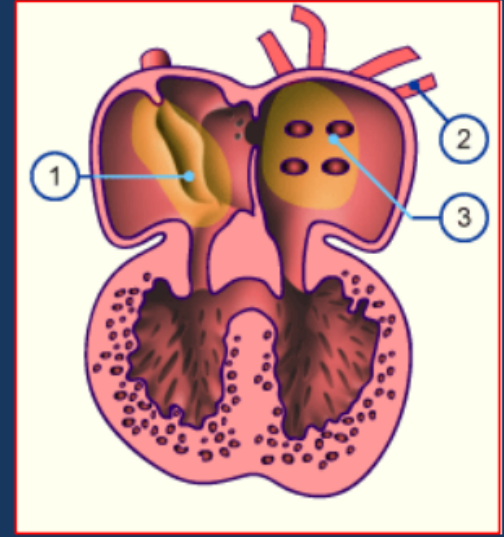




32.gün



33. gün



36. gün

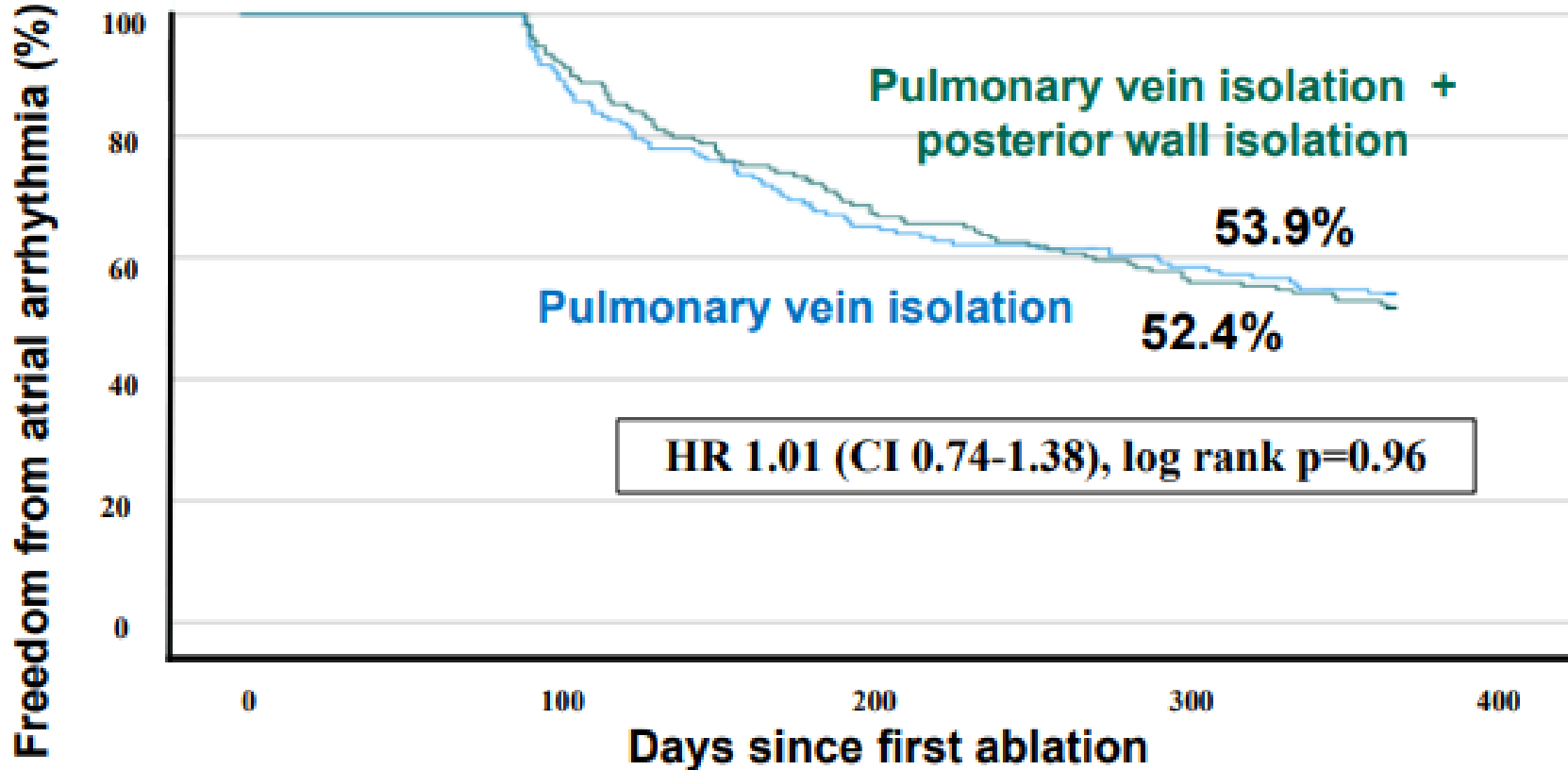
LA arka duvar ve PV aynı dokudan oluşmaktadır ve bu nedenle benzer elektrofizyolojik özellik



LA Arka Duvar İzolasyon dataları



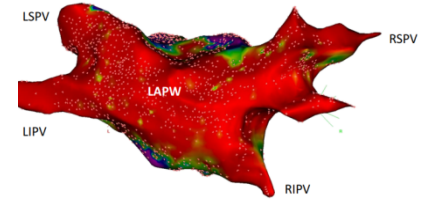
Kişi, yıl	n	AF tip	Çalışma tipi	Non-PV ablasyon tipi	Takip	AF başarısı
Kumagai ve ark J Cardiovasc Electrophysiol. 2007 Sep;18(10):1047-52.	91	PAF %100	Prospektif (PVAI+LAPW izolasyon)	Lineer ablasyon Box	13 ay	%95
Tamborero ve ark Circ Arrhythm Electrophysiol. 2009 Feb;2(1):35-40.	120	PAF %60, PrAF %20, LSPAF %20	RCT (PWAI+roof vs PWAI+roof+LAPWI	Lineer ablasyon	10 ay	%55 vs %55 NS
Lim ve ark Circ Arrhythm Electrophysiol. 2012 Oct;5(5):968-77	220	PAF %61, PrAF %22, LSPAF %17	RCT (PWAI+roof vs PWAI+roof+LAPWI	Lineer ablasyon	2 yıl	%52vs %48 NS
Kim ve ark Int J Cardiol. 2015 Feb 15;181:277-83	120	PrAF %100	RCT (PWAI+roof+anterior+CTI vs PWAI+roof+anterior+CTI +LAPWI	Lineer ablasyon	12 ay	%63 vs %83
Bai ve ark J Am Heart Assoc. 2016 Oct 10;5(10):	52	PrAF %100	prospektif (PWAI+SVC izolasyon vs PWAI+SVC izolasyon+LAPWI	Genişletilmiş ablasyon	3 yıl	%10 vs %40



No. at risk					
PVI alone	167	152	107	95	86
PVI + PWI	170	158	114	94	88

Posterior wall isolation using the cryoballoon in conjunction with pulmonary vein ablation is superior to pulmonary vein isolation alone in patients with persistent atrial fibrillation: A multicenter experience

Arash Aryana¹, James H Baker², Martin A Espinosa Ginic², Deep K Pujara³, Mark R Bowers⁴,



JICE (2019) 56:1-7

390 hasta LAPWI yapılanlarda işlem sırasında AF sonlanması daha fazla ve AF nüks daha az

Posterior box isolation as an adjunctive ablation strategy during repeat ablation with the second-generation cryoballoon for recurrence of persistent atrial fibrillation: 1-year follow-up

Heart Rhythm. 2018;15:1121-9.

Saverio Iacopino¹ · Gaetano Paparella² · Lucio Capulzini² · Erwin Ströker² · Stefan Beckers² ·

33 hasta 12 aylık AF ablasyon başarısı %85, işlemde LAPW izolasyonu başarısı %91

Posterior box isolation as an adjunctive ablation strategy with the second-generation cryoballoon for **paroxysmal atrial** fibrillation: a comparison with standard cryoballoon pulmonary vein isolation

JICE(2021) 61:313-319

Antonio Bisignani¹ · Ingrid Overeinder¹ · Shuichiro Kazawa¹ · Saverio Iacopino¹ · Federico Cecchini¹ ·

80 hasta 12 aylık PAF ablasyon başarısı benzer %90 vs %88, yapılan ilk çalışma



Received: 4 January 2022 | Revised: 24 February 2022 | Accepted: 18 March 2022

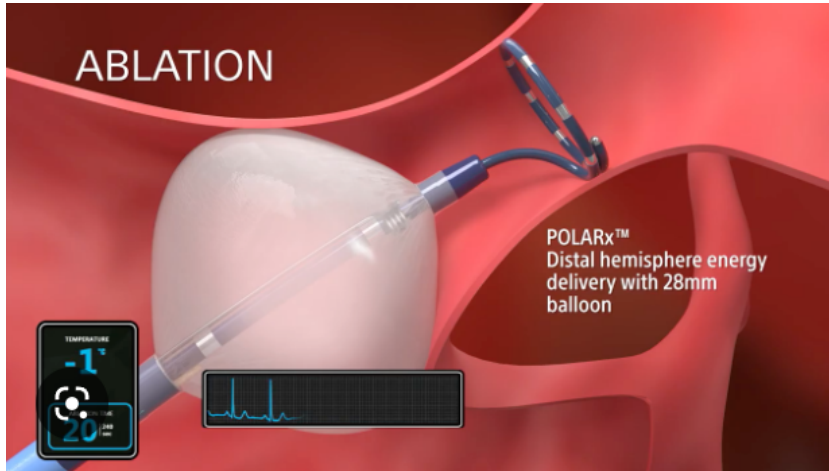
DOI: 10.1111/pace.14495

ELECTROPHYSIOLOGY

PACE  WILEY

Feasibility and safety of left atrial posterior wall isolation with a new Cryoballoon technology in patients with persistent atrial fibrillation


Antonio Bisignani MD^{1,2}  | Luigi Pannone MD¹  | Vincenzo Miraglia MD¹ |



80 hasta LAPW izalasyon başarısı POLARx de %95, Arctic Front Advance PRO %90 (ns)

Kişi, yıl	n	AF tip	Çalışma tipi	Non-PV ablasyon tipi	Takip	AF başarısı
Arruda ve ark	407	PAF %51, PrAF %10, LSPAF %39	Prospektif (PVAI+SVC izalasyon)	SEgmental ablasyon	450 gün	%84
J Cardiovasc Electrophysiol . 2007 Dec;18(12):1261-6.						
Corrado ve ark	320	PAF %46, PrAF %23, LSPAF %31	RCT (PWAI vs PWAI+SVCI)	Segmental ablasyon	12 ay	%74 vs %81 NS %77 vs %90 (PAF)
J Cardiovasc Electrophysiol . 2010 Jan;21(1):1-5.						
CHANg ve ark	68	PAF %100	Prospektif (PWAI+SVCI+CTI)	SEgmental ablasyon	88 ay	%65
J Cardiovasc Electrophysiol . 2012 Sep;23(9):955-61.						
Ejima ve ark	186	PAF %100	Prospektif(PwAI+ non-PV trigger vs PWAI+SVCI+non- PV triger)	SEgmental ablasyon	27 ay	%56 vs %77
Am J Cardiol . 2015 Dec 1;116(11):1711-6.						

Comparison between superior vena cava ablation in addition to pulmonary vein isolation and standard pulmonary vein isolation in patients with paroxysmal atrial fibrillation with the cryoballoon technique

Ingrid Overeinder¹ • Thiago Guimarães Osório¹ • Paul-Adrian Călburean¹ • Antonio Bisignani¹ • Gezim Bala¹ • Juan Sieira¹ • Erwin Ströker¹ • Maysam Al Houssari¹ • Joerelle Mojica¹ • Serge Boveda¹ • Gaetano Paparella¹ • Pedro Brugada¹ • Carlo de Asmundis¹ • Gian-Battista Chierchia¹ 

100 hasta PAF ablasyon başarısı PVI ile %72, PVI ek SVC izolasyonu %90



Persistan atriyal fibrilasyon hastasının kriyobalon ile ablasyonu



- 63 yaş, erkek
- HT (+)
- 2019 yılında AF tanısı
- Amiodarone rağmen klinik AF
- AF ablasyonu için dış merkezden sevk

Im: 1/18
Se: 1

ADANA SERIK HASTANESI
35055373
Coronary^Diagnostic Coronary Catheterization
FL Card

WL: 109
RAO: 2

You have 8 days left in your trial period.
Purchase a license at <https://radiantviewer.com/store/>
This session will end in 15 minutes.

24.07.2020 15:36:33

Im: 1/152
Se: 3

ADANA SERIK HASTANESI
35055373
Coronary^Diagnostic Coronary Catheterization
FL Card

WL: 109
RAO: 2

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This session will end in 15 minutes.

24.07.2020 15:41:48

Im: 1/19
Se: 4

ADANA SERIK HASTANESI
35055373
Coronary^Diagnostic Coronary Catheterization
FL Card

WL: 109

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Im: 1/89
Se: 6

ADANA SERIK HASTANESI
35055373
Coronary^Diagnostic Coronary Catheterization
FL Card

WL: 109

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Im: 1/95

Se: 16



ADANA

35055373

Coronary^Diagnostic Coronary Catheterization

FL Card

WL: 109

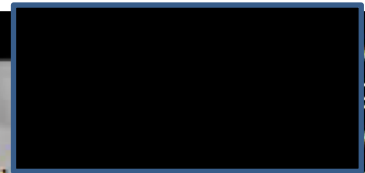
RAO: 30 CRA: 18

You have 8 days left in your trial period.
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24.07.2020 16:01:05

Im: 1/13

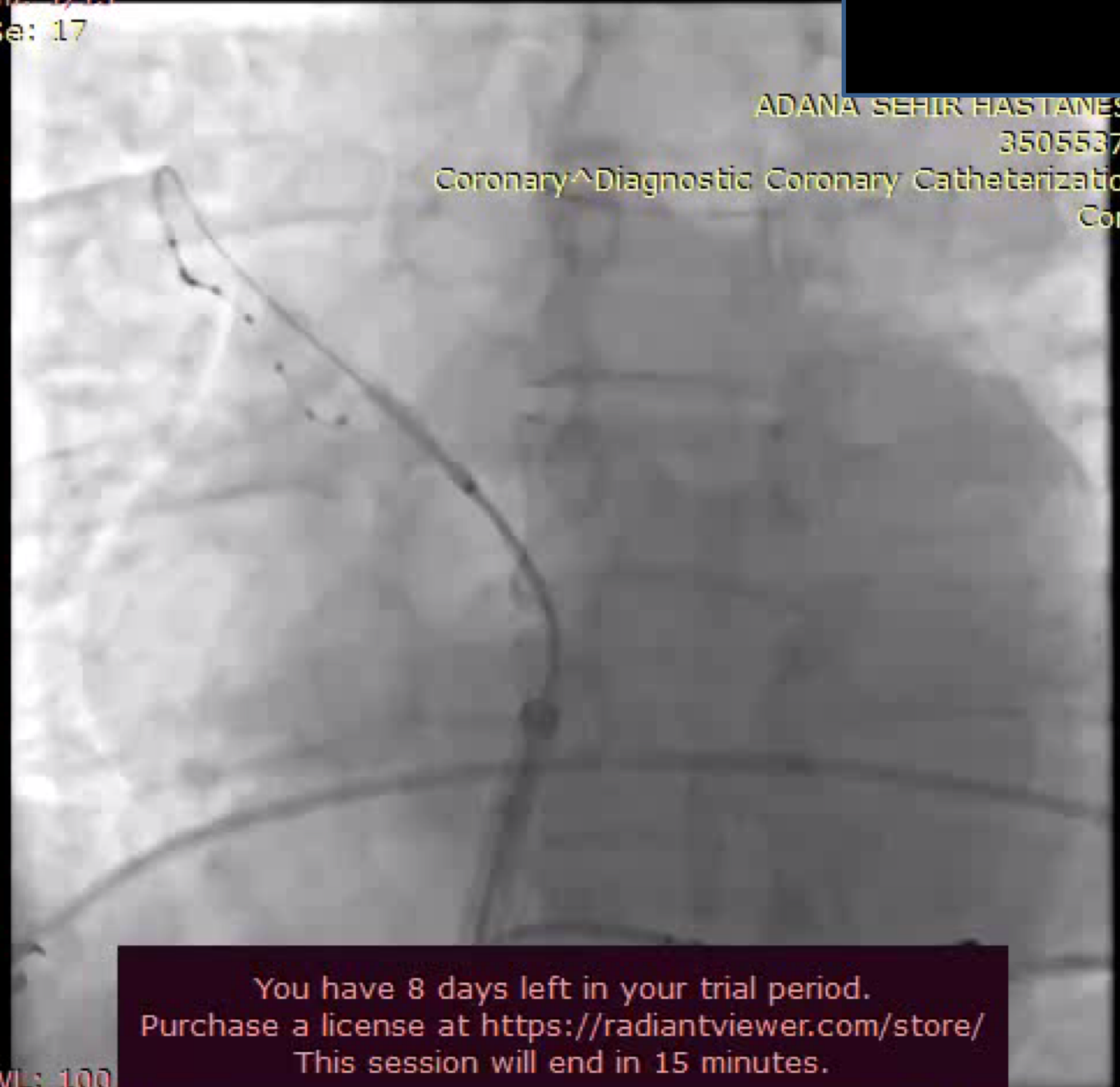
Se: 17



ADANA SEHIR HASTANESI

35055373

Coronary^Diagnostic Coronary Catheterization
Coro



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Purchase a license at <https://radiantviewer.com/store/>
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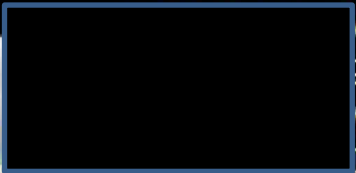
WL: 100

LAO: 2 CAU: 3

24.07.2020 16:18:11

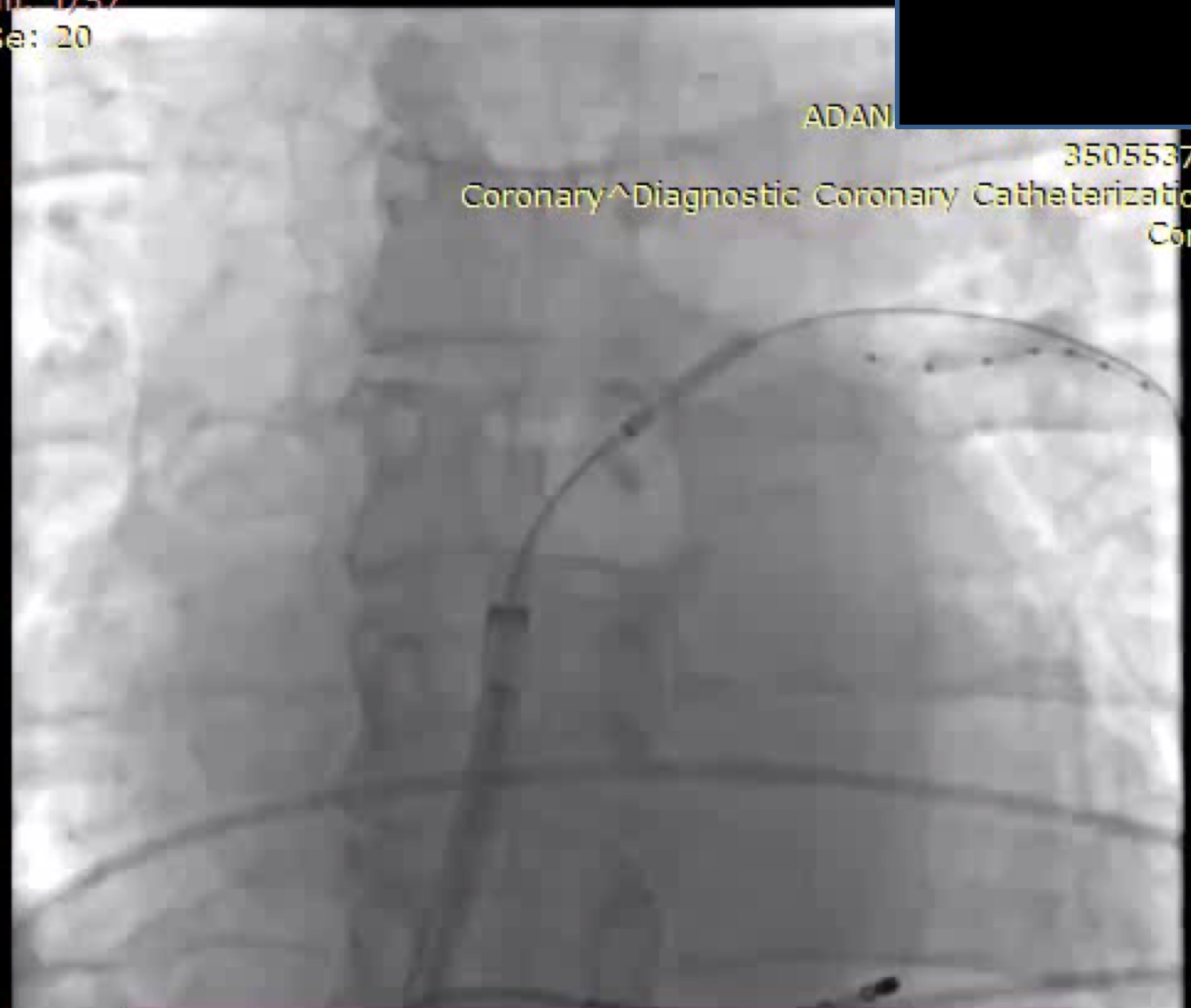
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Se: 20

ADAN



35055373

Coronary^Diagnostic Coronary Catheterization
Coro



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This session will end in 15 minutes.

WL: 100

LAO: 2 CAU: 3

24.07.2020 16:27:08

Im: 1/66

Se: 21

ADANA SEHİR HASTANESİ

35055373

Coronary^Diagnostic Coronary Catheterization

Coro

WL: 110

LAO: 2 CAU: 3

24.07.2020 16:31:14

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This session will end in 15 minutes.

Im: 1/54

Se: 22

ADANA SENEK HASTANESI

35055373

Coronary Diagnostic Coronary Catheterization
Coro

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This session will end in 15 minutes.

WL: 116

LAO: 5 CAU: 39

24.07.2020 16:34:23



TEŞEKKÜRLER