atriyal fibrilasyon derneği
6. AF Zirvesi Bahar Toplantısı
7 - 8 Nisan 2017 / Cornelia Hotel, Antalya

AF ablasyonu sonrası ÖKSÜRÜK ve DİSPNE gelişti. Ne yapalım?

Dr. Ata KIRILMAZ

- Üşütmüşsünüz geçer
- Komplikasyon ?

Table 2 Outcomes During and After Hospitalization for AF Ablation

Inpatient Complication or Rehospitalization	Patients Undergoing AF Ablation (N = 4,156)
Any complication	211 (5.1)
Vascular complication	110 (52.1)
Hematoma/hemorrhage only	93 (44.1)
Perforation/tamponade	104 (49.3)
Stroke	10 (4.7)
Pneumothorax/hemothorax	4 (1.9)
Transient ischemic attack	3 (1.4)
Death	1 (0.5)
30-day rehospitalization	
All-cause	390 (9.4)
AF/atrial flutter	105 (26.9)
Any procedural complication	76 (19.5)
Pneumothorax/hemothorax	3 (0.8)
Vascular complication	45 (11.5)
Perforations/tamponade	12 (3.1)
Acute stroke*	19 (4.9)
Death	9 (2.3)

Values are n (% of complications or 30-day rehospitalizations). *Acute strokes include hemorrhagic and ischemic events plus transient ischemic attacks.

Abbreviation as in Table 1.

Procedural Complications, Rehospitalizations, and Repeat Procedures After Catheter Ablation for Atrial Fibrillation

Rashmee U. Shah, MD, MS,* James V. Freeman, MD, MPH,* David Shilane, PhD,* Paul J. Wang, MD,* Alan S. Go, MD,†‡ Mark A. Hlatky, MD*

Stanford, Oakland, and San Francisco, California

Komplikasyon oranı (565/4156) % 13.6

Ölüm oranı (10/4156) % 0.24

(J Am Coll Cardiol 2012;59:143–9)

Worldwide Survey on the Methods, Efficacy, and Safety of Catheter Ablation for Human Atrial Fibrillation

Riccardo Cappato, MD; Hugh Calkins, MD; Shih-Ann Chen, MD; Wyn Davies, MD; Yoshito Iesaka, MD; Jonathan Kalman, MD; You-Ho Kim, MD; George Klein, MD; Douglas Packer, MD; Allan Skanes, MD

Background—The purpose of this study was to conduct a worldwide survey investigating the methods, efficacy, and safety of catheter ablation (CA) of atrial fibrillation (AF).

Methods and Results—A detailed questionnaire was sent to 777 centers worldwide. Data relevant to the study purpose were collected from 181 centers, of which 100 had ongoing programs on CA of AF between 1995 and 2002. The number of patients undergoing this procedure increased from 18 in 1995 to 5050 in 2002. The median number of procedures per center was 37.5 (range, 1 to 600). Paroxysmal AF, persistent AF, and permanent AF were the indicated arrhythmias in 100.0%, 53.0%, and 20.0% of responding centers, respectively. The most commonly used techniques were right atrial compartmentalization between 1995 and 1997, ablation of the triggering focus in 1998 and 1999, and electrical disconnection of multiple pulmonary veins between 2000 and 2002. Of 8745 patients completing the CA protocol in 90 centers, of whom 2389 (27.3%) required >1 procedure, 4550 (52.0%; range among centers, 14.5% to 76.5%) became asymptomatic without drugs and another 2094 (23.9%; range among centers, 8.8% to 50.3%) became asymptomatic in the presence of formerly ineffective antiarrhythmic drugs over an 11.6±7.7-month follow-up period. At least 1 major complication was reported in 524 patients (6.0%).

Conclusions—The findings of this survey provide a picture of the variable and evolving methods, efficacy, and safety of CA for AF as practiced in a large number of centers worldwide and may serve as a guide to clinicians considering therapeutic options in patients suffering from this arrhythmia. (***Circulation*. 2005;111:1100-1105.**)

Majör Komplikasyon oranı (524/8745) % 5.9

TABLE 4. Major Complications

Complication Type	No. of Patients	% of Patients
For all types of procedures (n=8745 patients)		
Periprocedural death	4	0.05
Tamponade	107	1.22
Sepsis, abscesses, or endocarditis	1	0.01
Pneumothorax	2	0.02
Hemothorax	14	0.16
Permanent diaphragmatic paralysis	10	0.11
Femoral pseudoaneurysm	47	0.53
Arterovenous fistulae	37	0.42
Valve damage	1	0.01
Aortic dissection	3	0.03
For procedures involving left atrial ablation (n=7154 patients)		
Stroke	20	0.28
Transient ischemic attack	47	0.66
PV stenosis		
No. with >50% stenosis		
Acute	23	0.32
Chronic	94	1.31
No. with closure		
Acute	2	0.03
Chronic	15	0.21
Patients with symptoms		
Acute	3	0.04
Chronic	41	0.57
Patients undergoing intervention		
Percutaneous	51	0.71
Surgical	2	0.03
Grand total	524	5.9

(*Circulation*. 2005;111:1100-1105.)

Frenik Sinir Yaralanması
Diafragma Paralizisi

- % 0.48
- Sağ > sol
- Sağ üst pulmoner ven veya SVC izolasyonu
- Sol frenik sinir - sol atrial appendiks ablasyonu

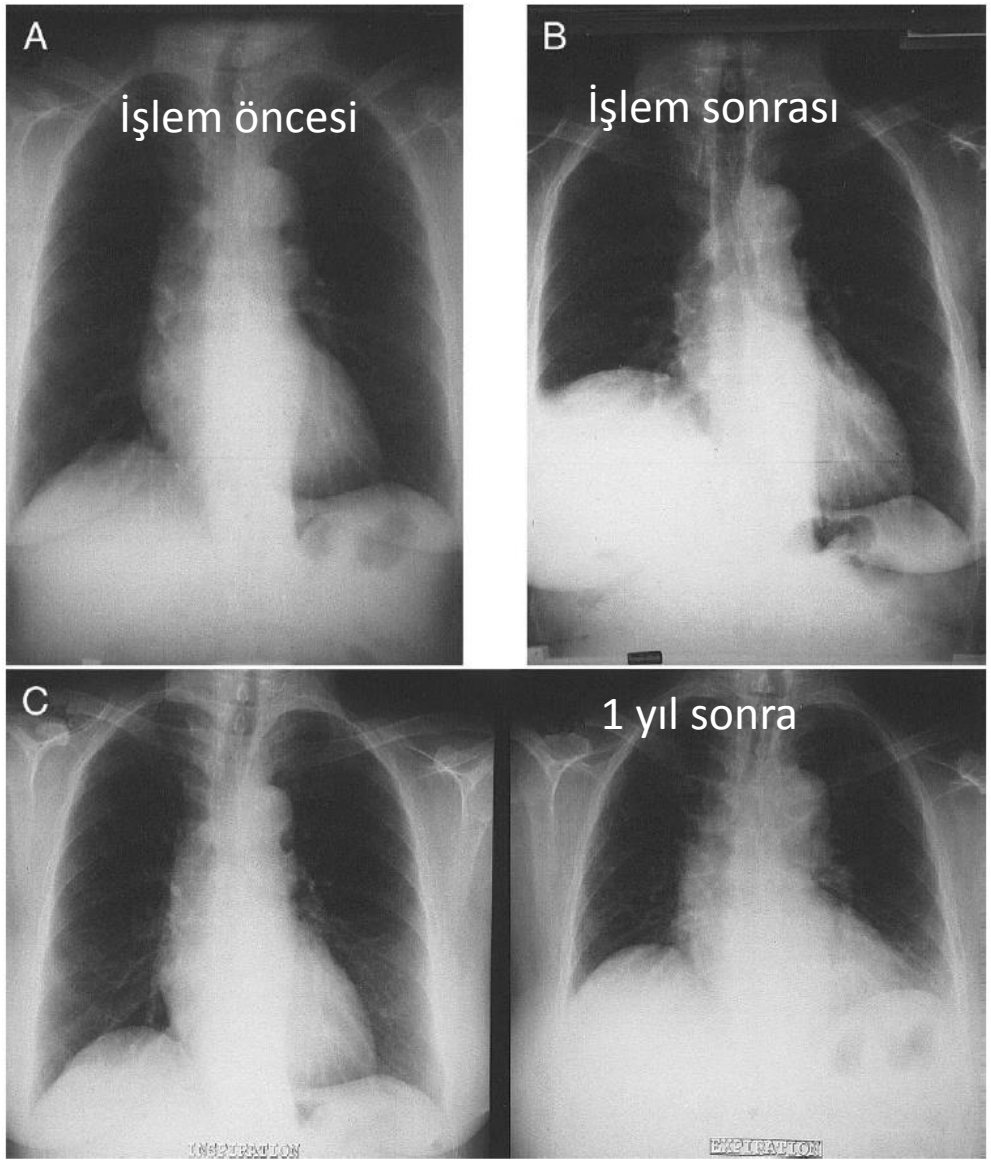
Antonio Sorgente; GianBattista Chierchia; Carlo de Asmundis; Andrea Sarkozy; Lucio Capulzini; PedroBrugada Europace. 2011;13(11):15261532.

Frenik Sinir Yaralanması (paralizisi) semptomları

- Öksürük
- Dispne
- Hıçkırık
- Plevral efüzyon
- Torasik ağrı (yan ağrısı)

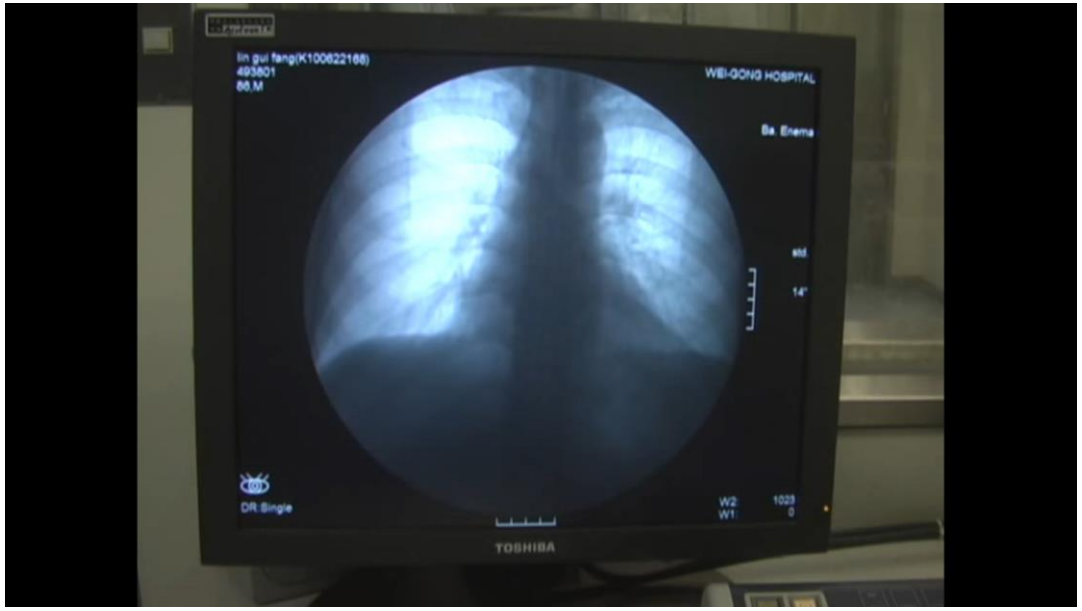
Frenik sinir yaralanması

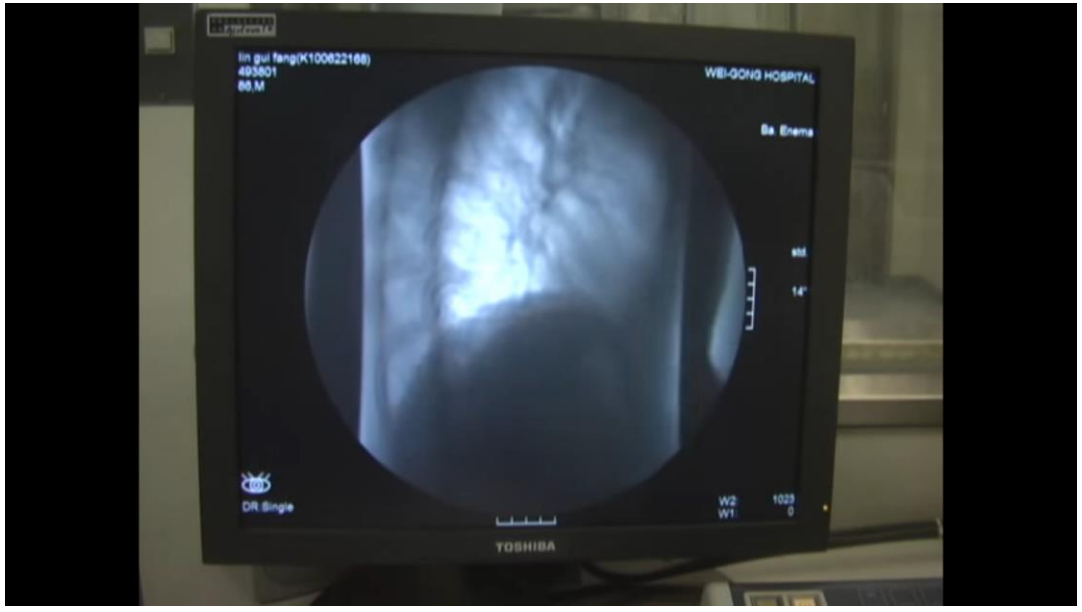
- Akciğer grafisi

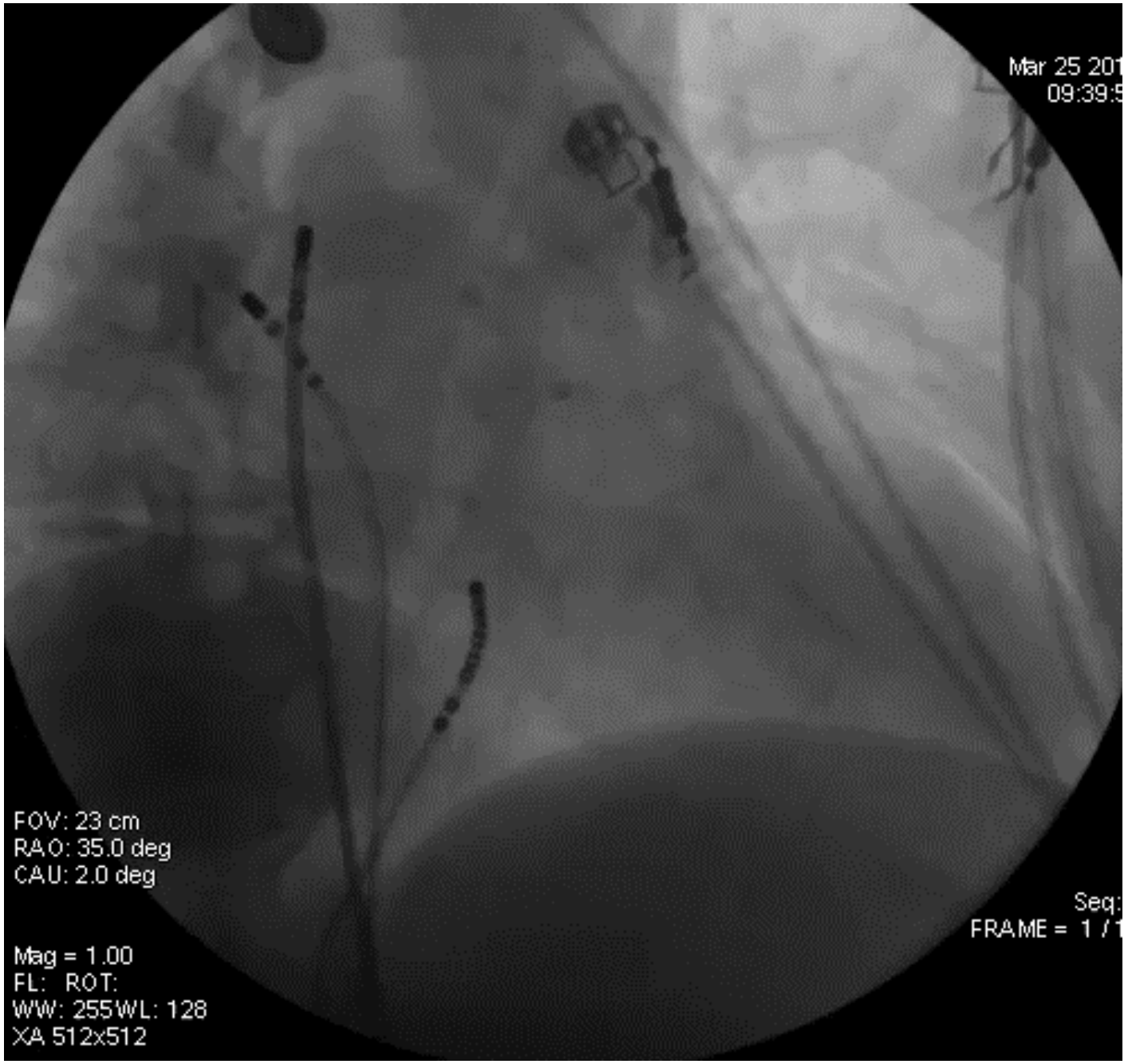


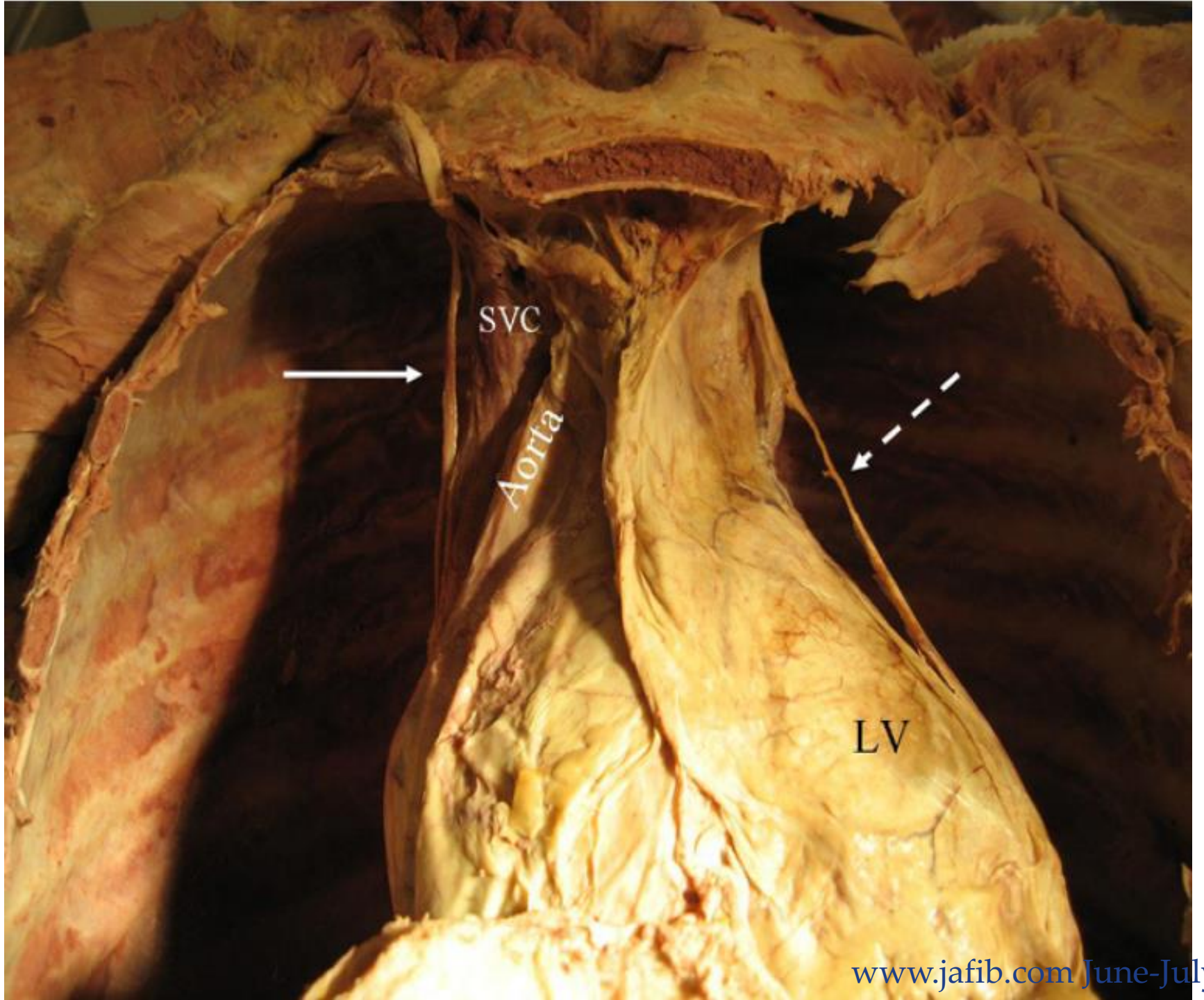
(J Am Coll Cardiol 2006;47:2498–503)

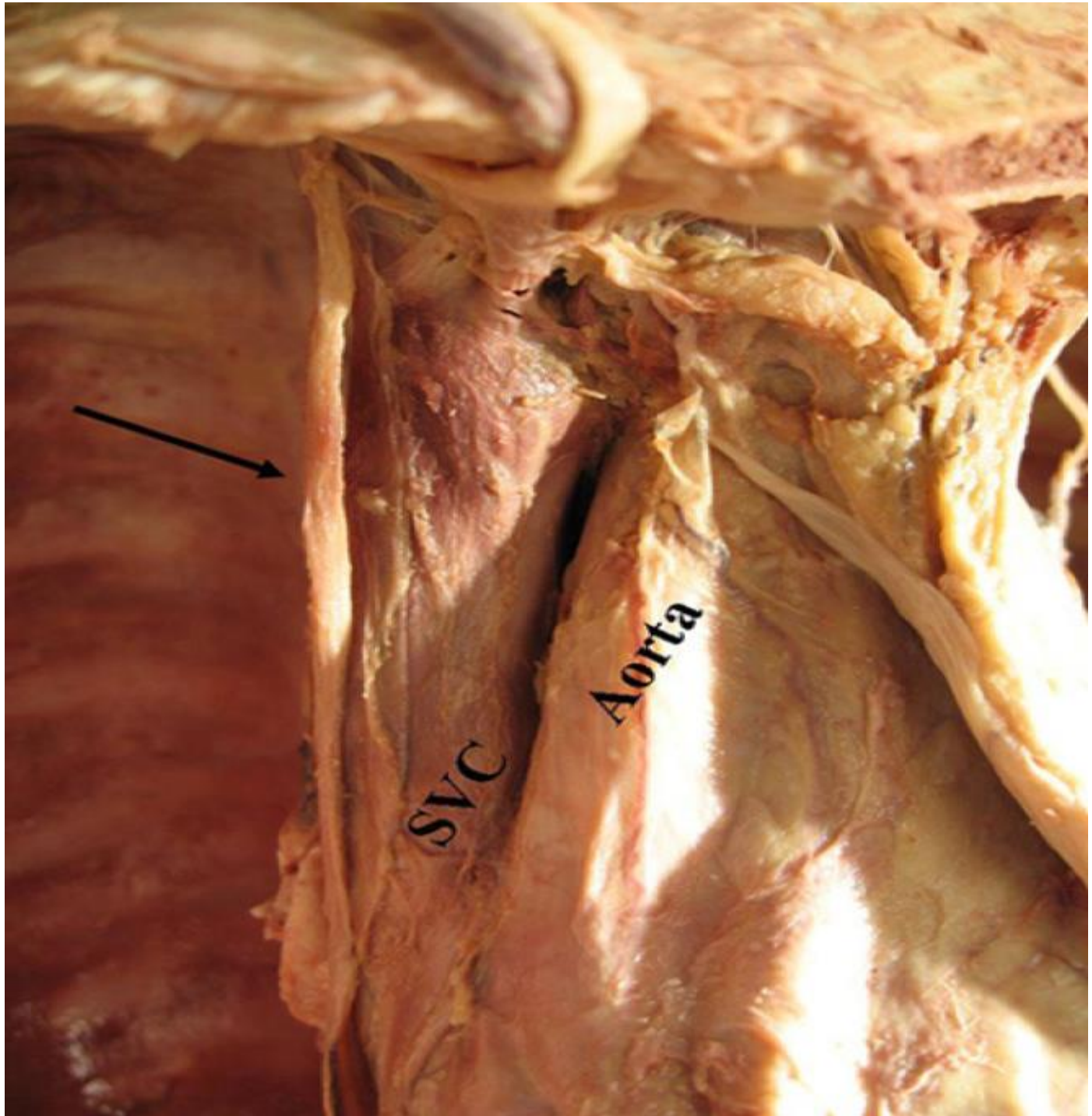
- Floro altında diafragma hareketleri (Koklama testi)

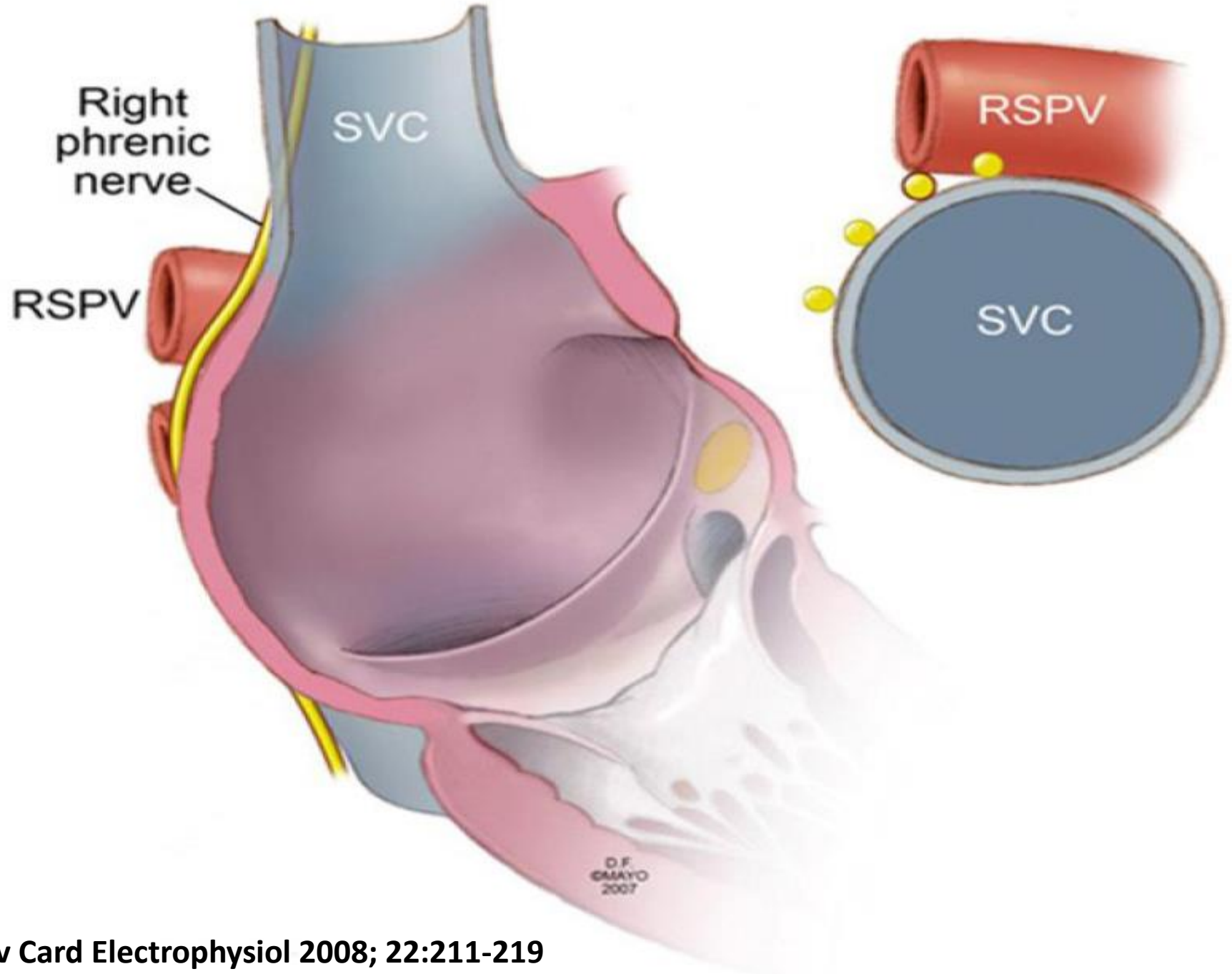




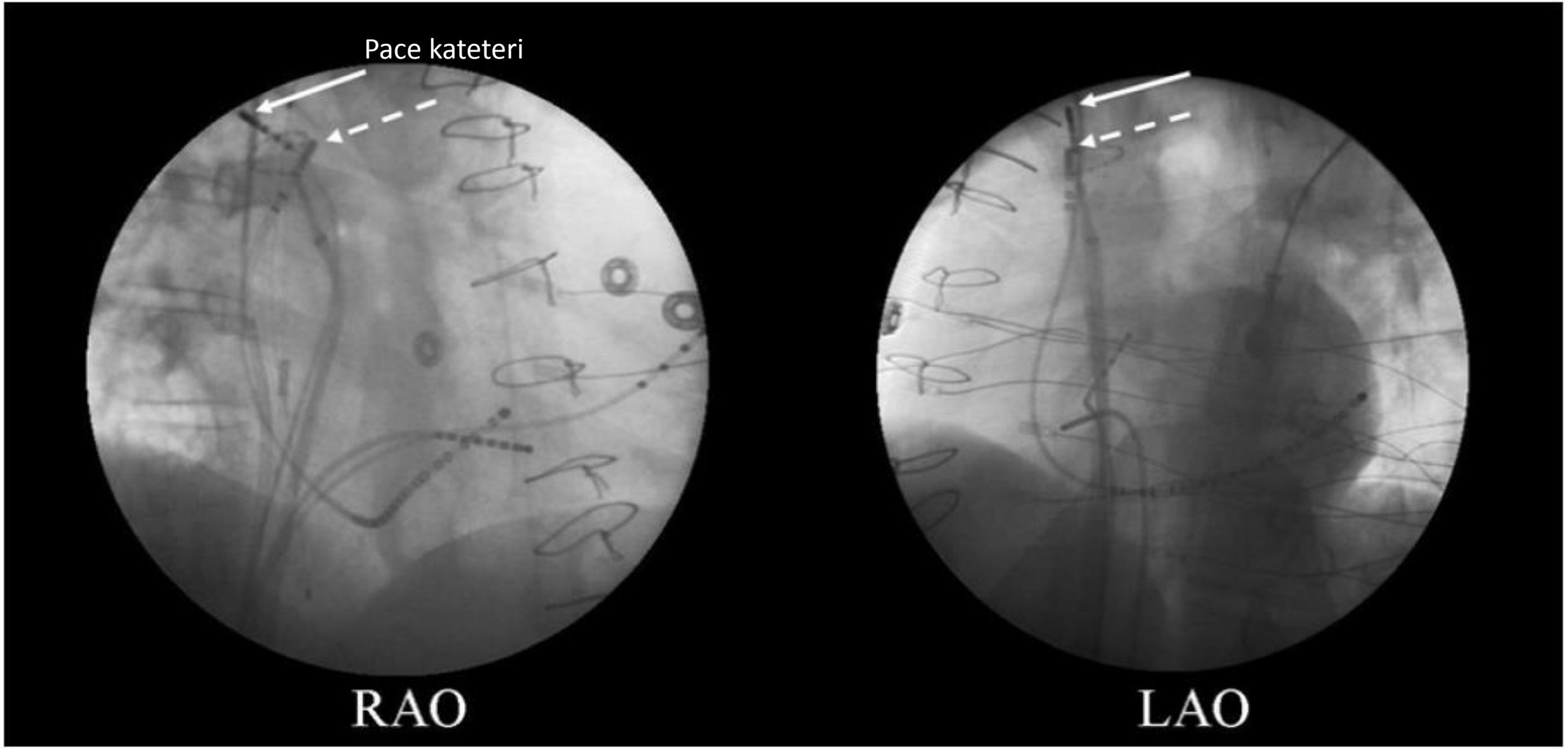

Mar 25 201
09:39:5
FOV: 23 cm
RAO: 35.0 deg
CAU: 2.0 deg
Seq:
FRAME = 1 / 1
Mag = 1.00
FL: ROT:
WW: 255WL: 128
XA 512x512

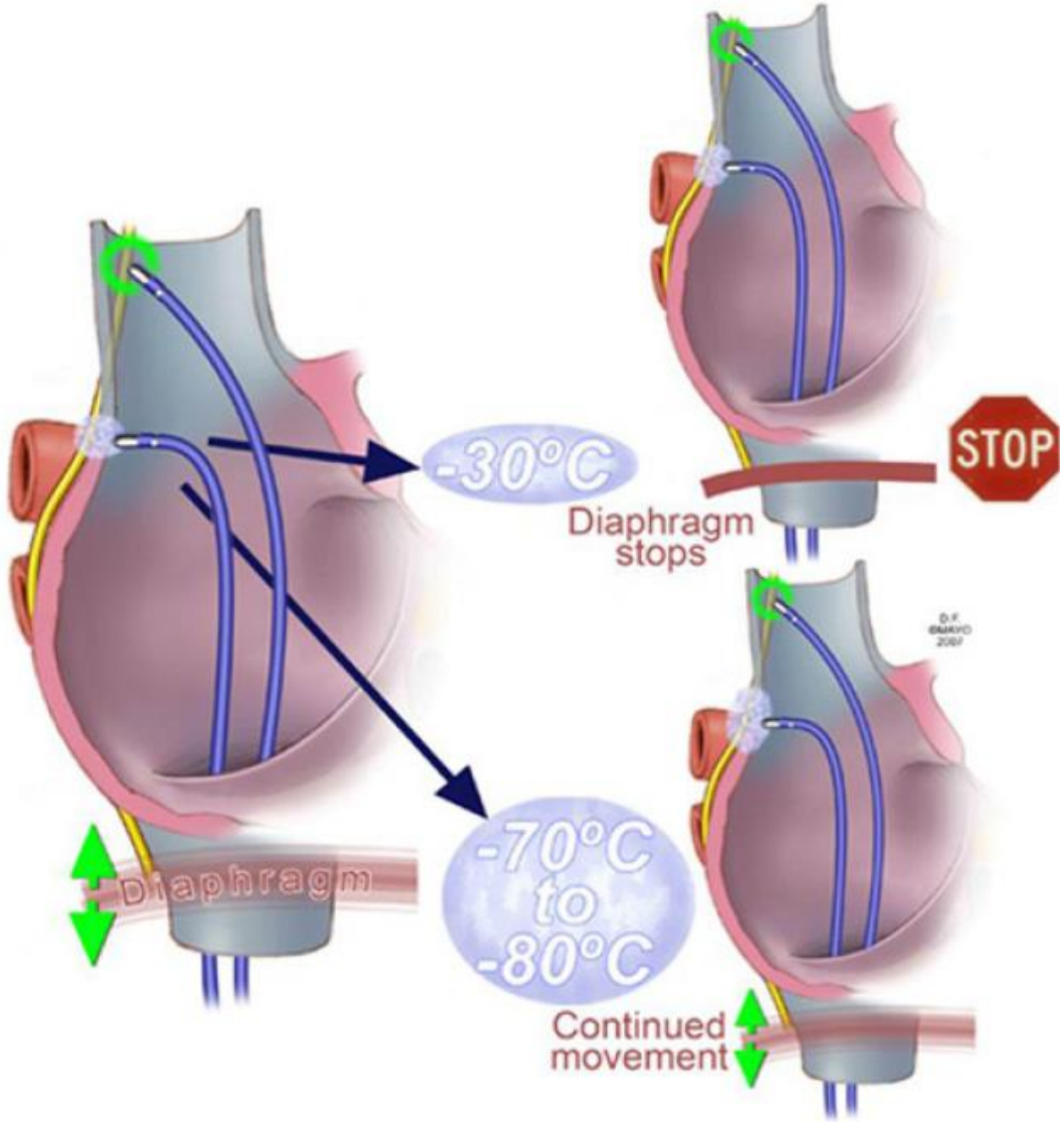

SVC
Aorta
LV

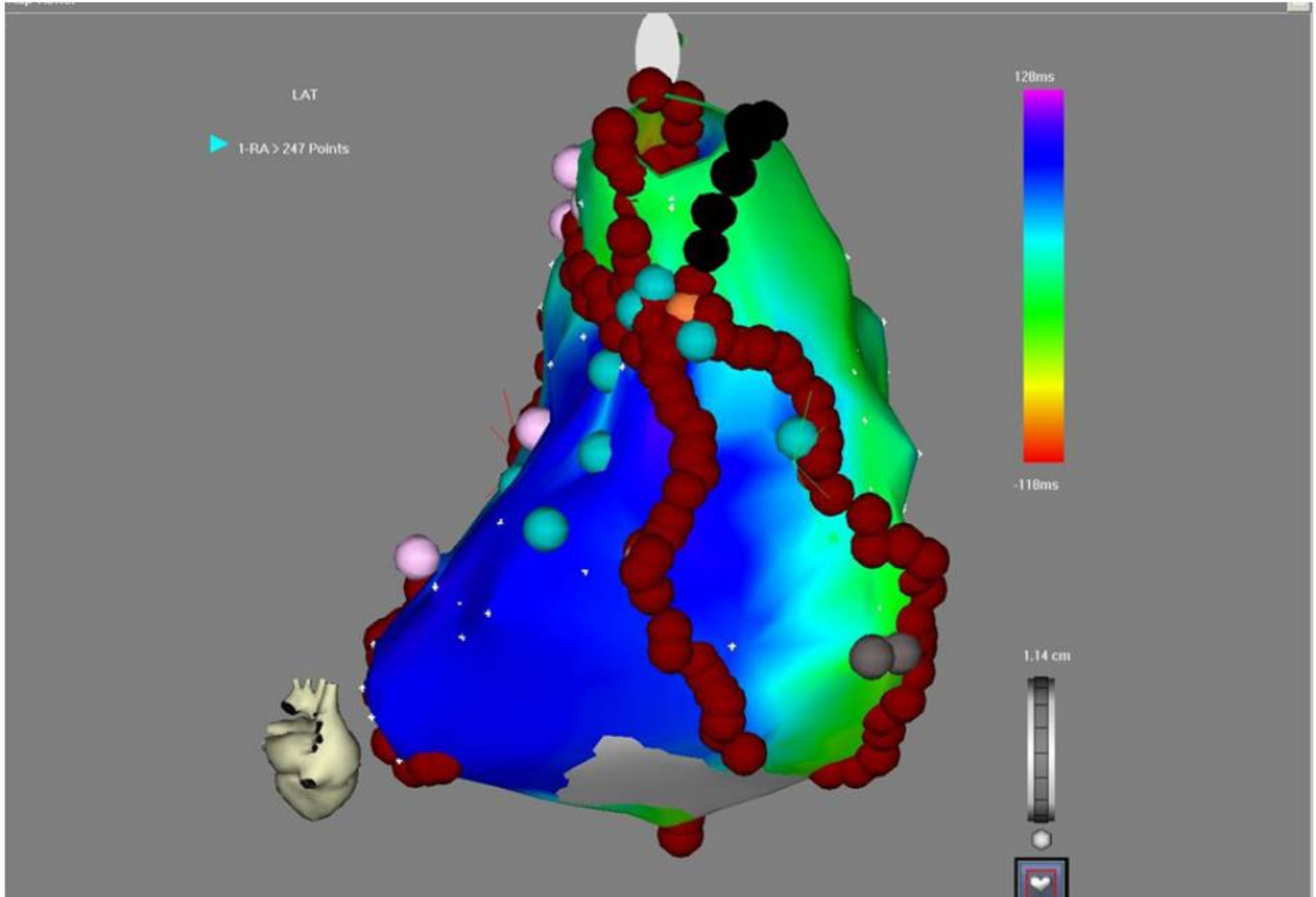

SVC
Aorta

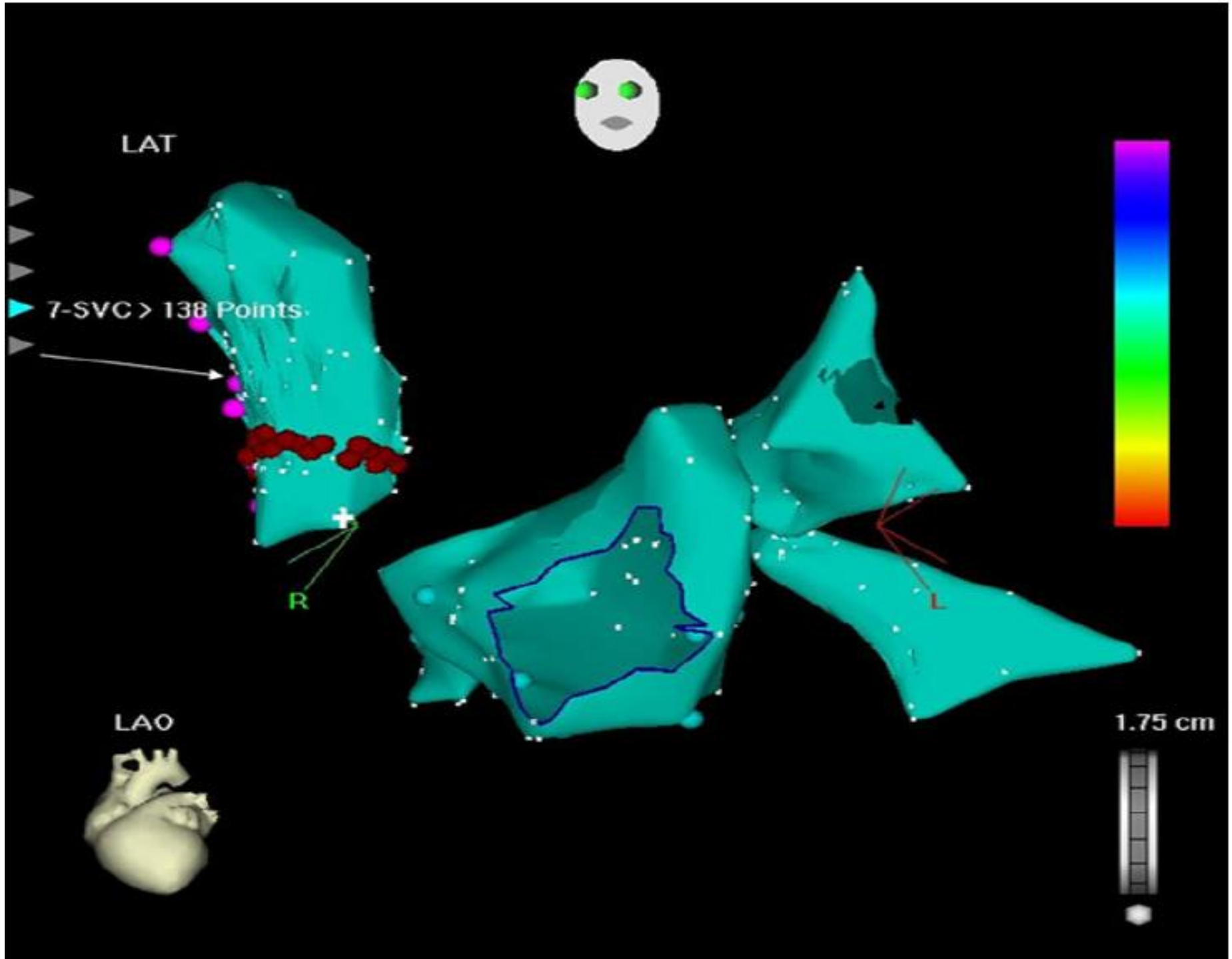


Bruce CJ et al, J Interv Card Electrophysiol 2008; 22:211-219


Pace kateteri
RAO
LAO


-30°C
STOP
Diaphragm stops
Diaphragm
-70°C to -80°C
Continued movement


LAT
1-RA > 247 Points
128ms
-118ms
1.14 cm


LAT
7-SVC > 138 Points
R
L
LAO
1.75 cm

IVYSPRING INTERNATIONAL PUBLISHER

International Journal of Medical Sciences

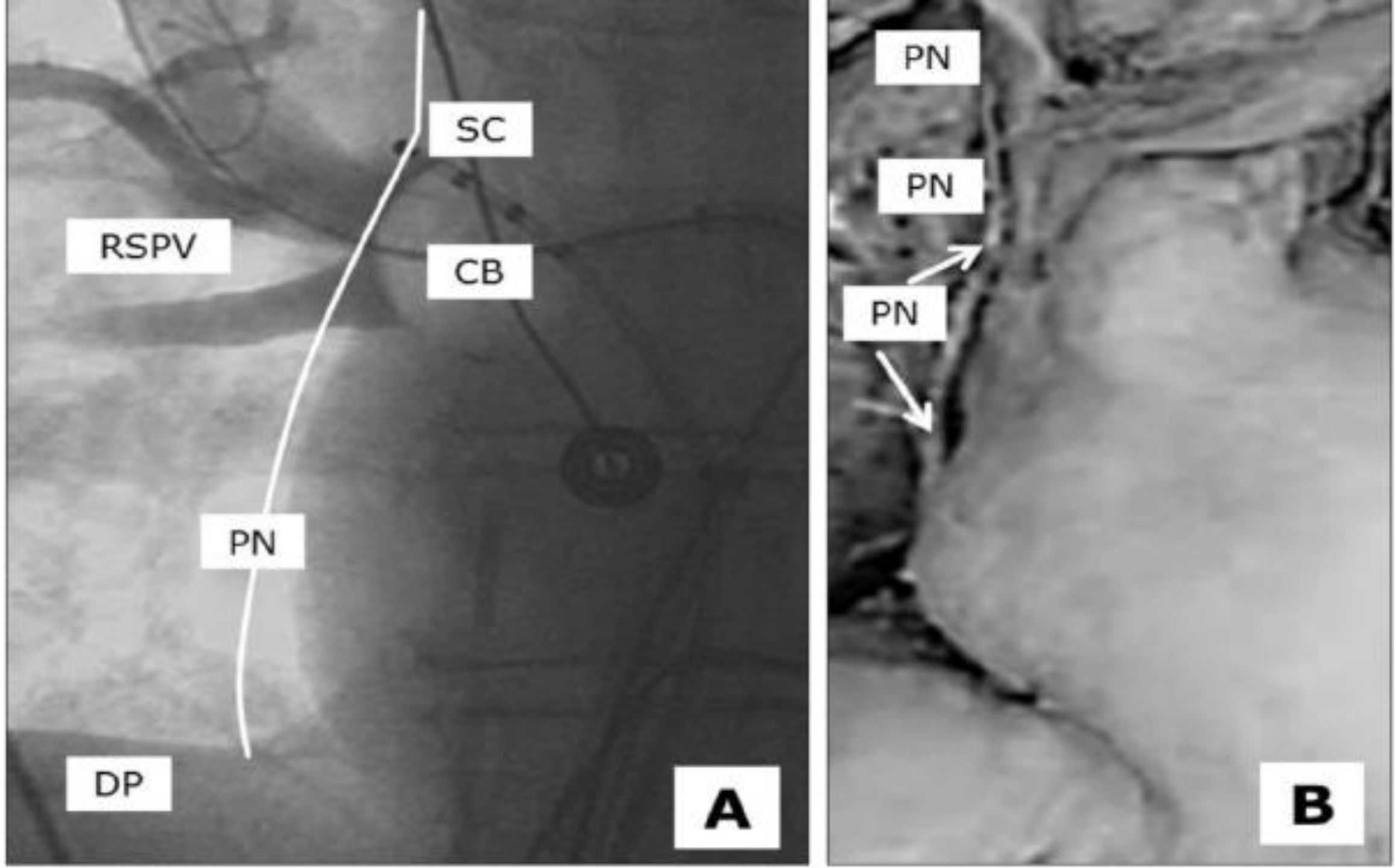
2016; 13(6): 403-411. doi: 10.7150/ijms.14383

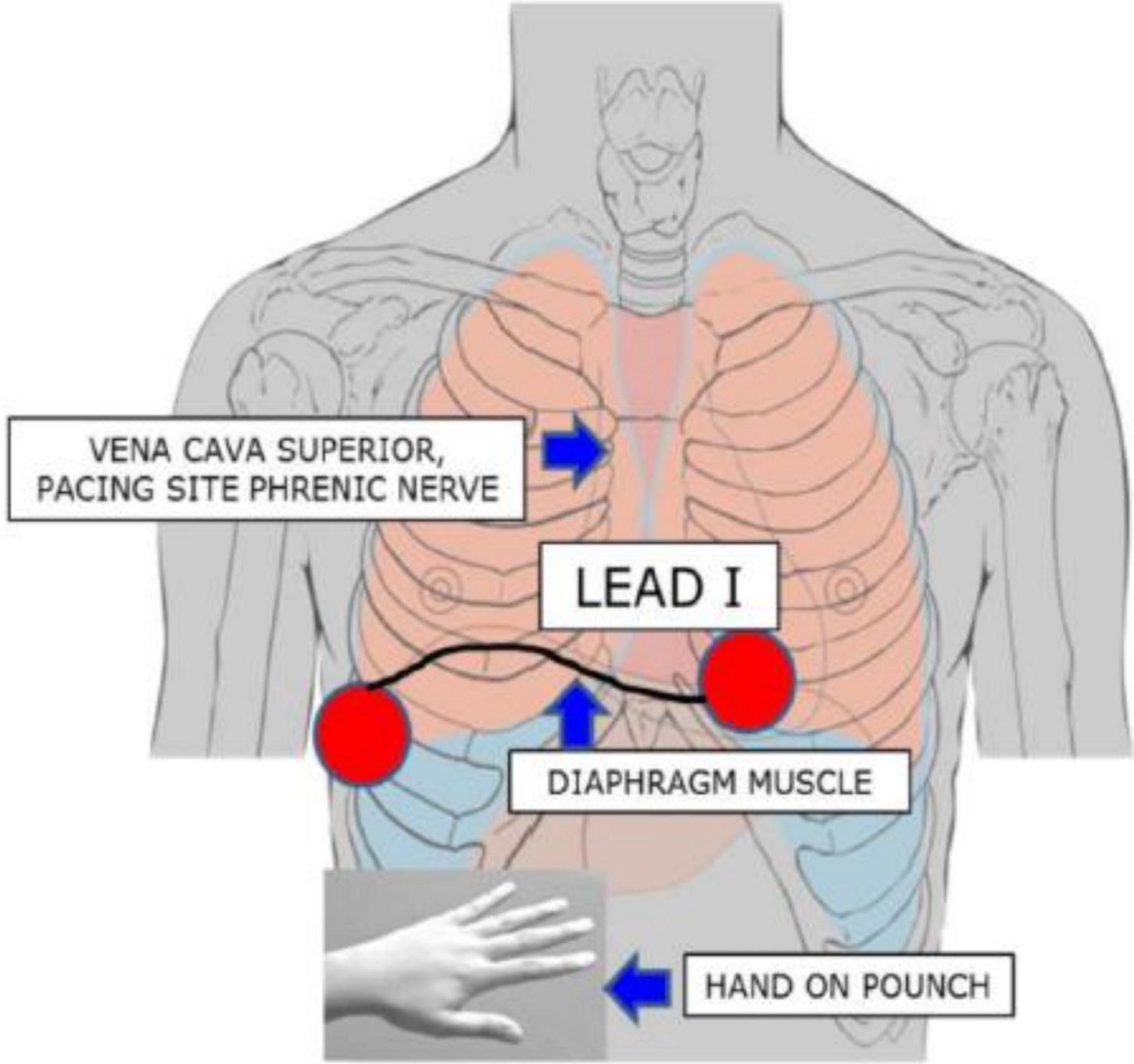
Research Paper

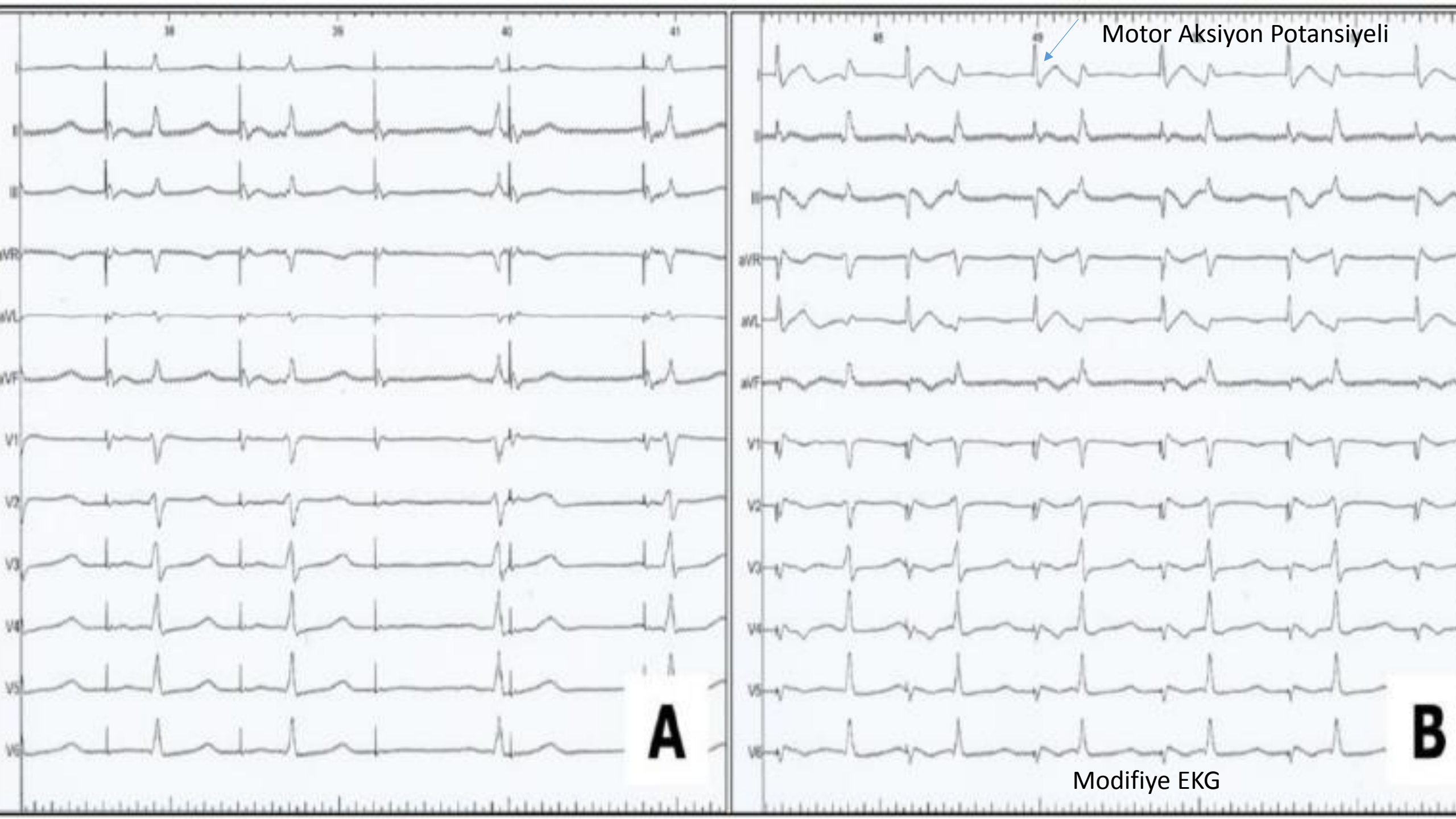
ECG-Guided Surveillance Technique in Cryoballoon Ablation for Paroxysmal and Persistent Atrial Fibrillation: A Strategy to Prevent From Phrenic Nerve Palsy

Axel Meissner[1]✉, Petra Maagh[1], Arndt Christoph[1], Ahmet Oernek[2], Gunnar Plehn[3]

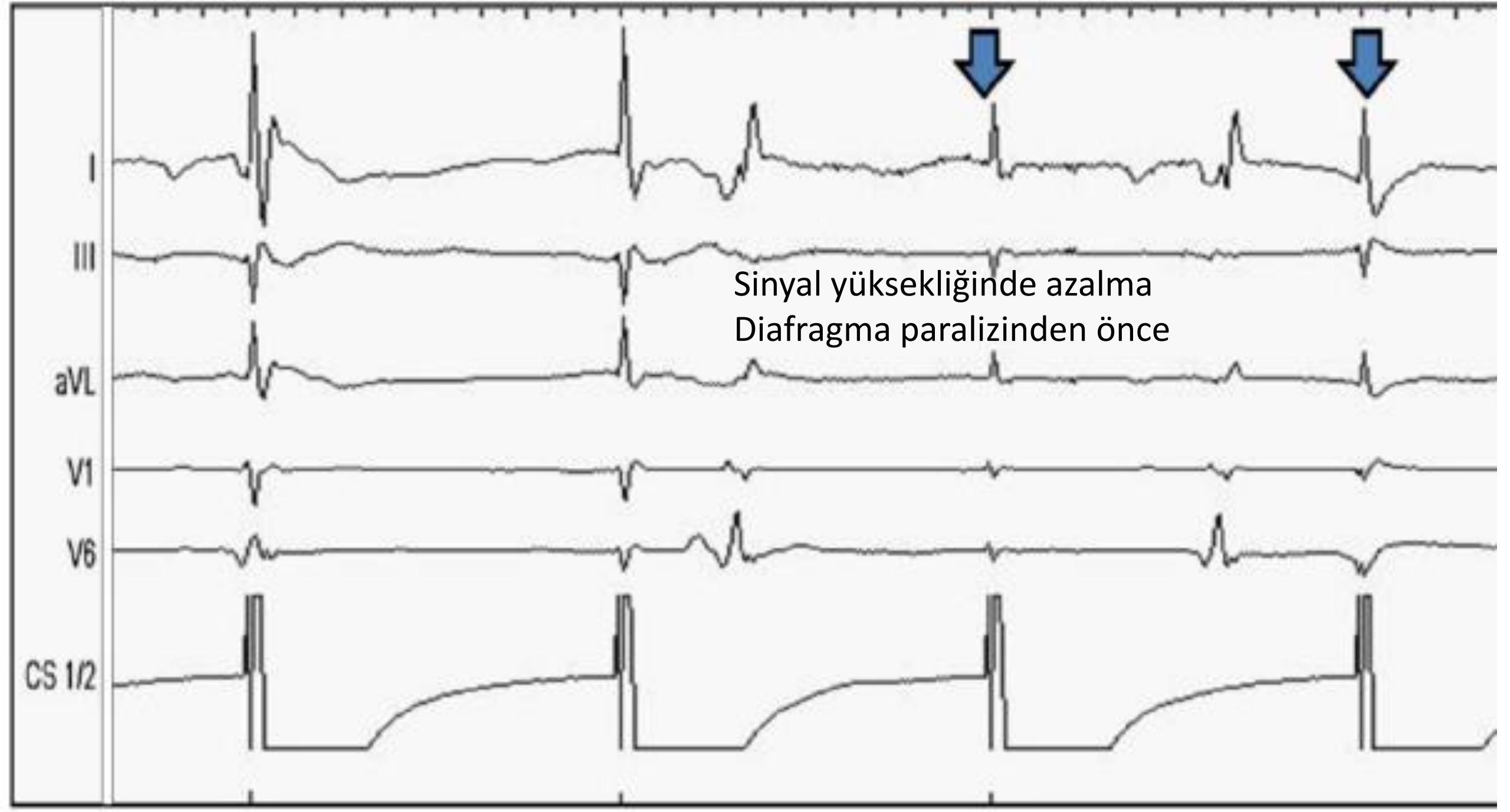
2016; 13(6): 403-411. doi: 10.7150/ijms.14383


SC
RSPV
CB
PN
DP
A
PN
PN
PN
B


VENA CAVA SUPERIOR,
PACING SITE PHRENIC NERVE
LEAD I
DIAPHRAGM MUSCLE
HAND ON POUNCH

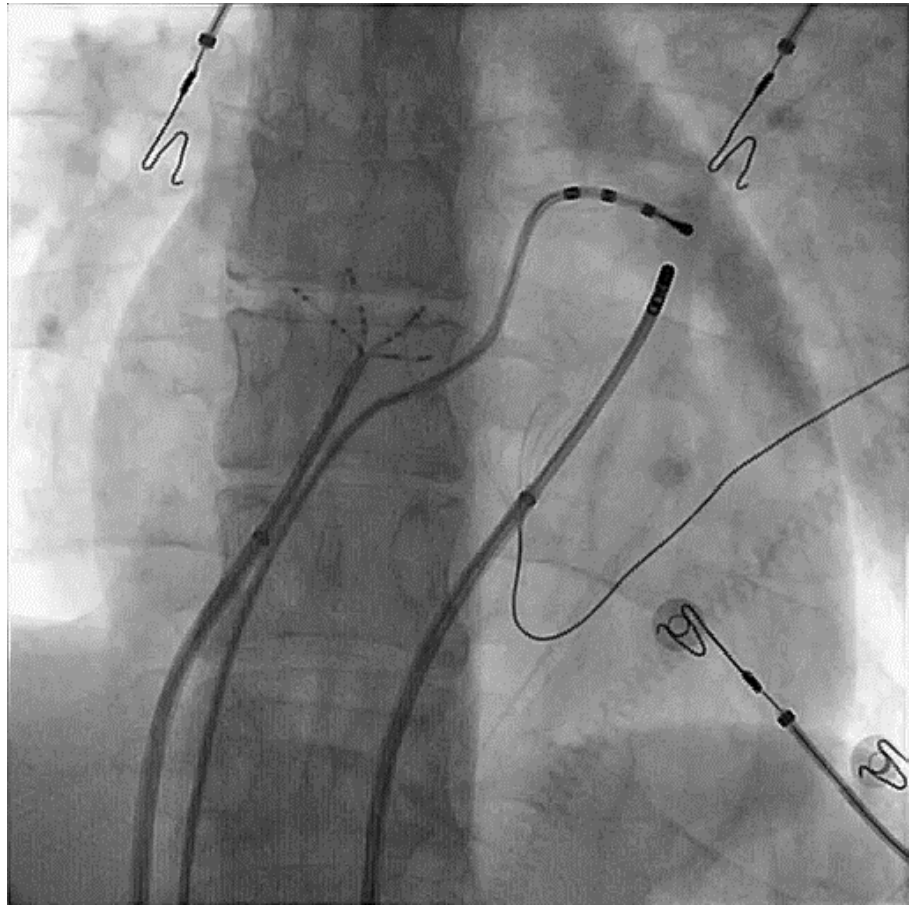

Motor Aksiyon Potansiyeli
A
B
Modifiye EKG

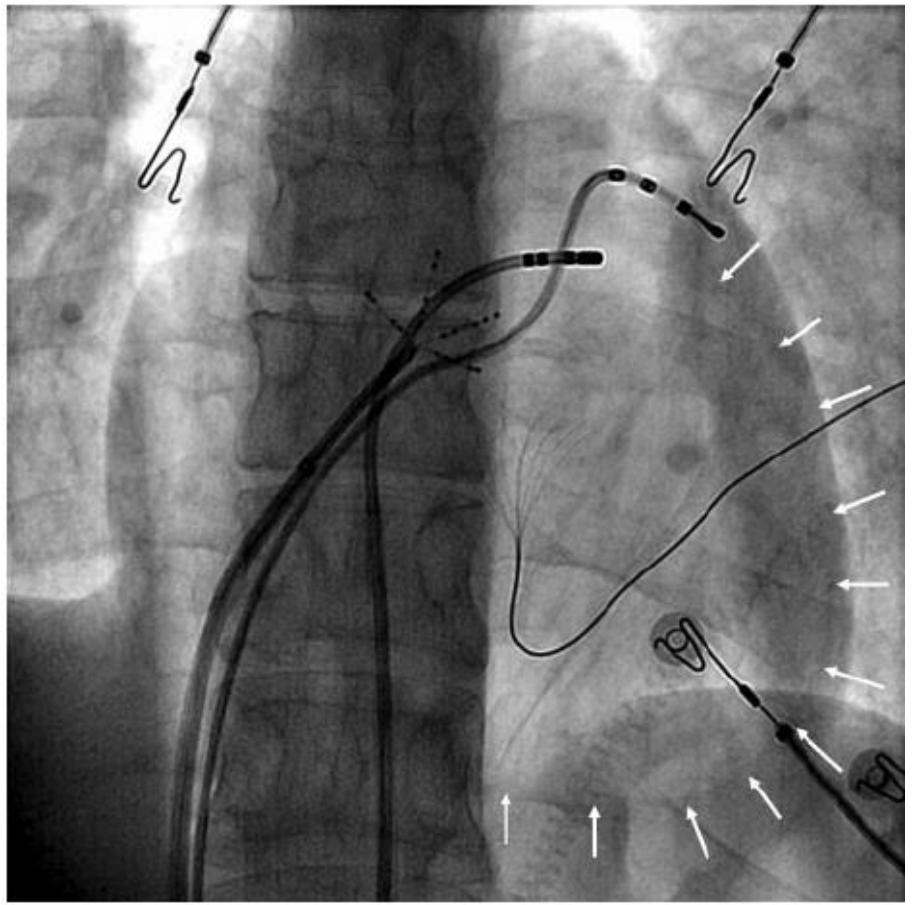
Motor Aksiyon Potansiyeli


I
III
aVL
V1
V6
CS 1/2
Sinyal yüksekliğinde azalma
Diafragma paralizinden önce

Novel Technique to Prevent Left Phrenic Nerve Injury During Epicardial Catheter Ablation

Seiichiro Matsuo, MD; Pierre Jaïs, MD; Sebastien Knecht, MD; Kang-Teng Lim, MD; Mélèze Hocini, MD; Nicolas Derval, MD; Matthew Wright, MBBS, PhD; Frederic Sacher, MD; Michel Haïssaguerre, MD





Phrenic Nerve Injury After Atrial Fibrillation Catheter Ablation

Characterization and Outcome in a Multicenter Study

Frédéric Sacher, MD,* Kristi H. Monahan, RN,†
Stuart P. Thomas, MD,‡ Neil Davidson, MD,§ Pedro Adragao, MD,‖
Prashanthan Sanders, MBBS, PHD,* Mélèze Hocini, MD,* Yoshihide Takahashi, MD,*
Martin Rotter, MD,* Thomas Rostock, MD,* Li-Fern Hsu, MBBS,* Jacques Clémenty, MD,*
Michel Haïssaguerre, MD,* David L. Ross, MD,‡ Douglas L. Packer, MD,† Pierre Jaïs, MD*

Bordeaux-Pessac, France; Rochester, Minnesota; Sydney, Australia; Manchester, United Kingdom; and Carnaxide, Portugal

TAM İYİLEŞME %66

KISMİ İYİLEŞME %17

KALICI PARALİZİ %17

1 gün – 19 ay

Table 2. Outcome and Characteristics of PNI

Patient	Outcome	Side	Clinical Features	Time of Diagnosis	Delay to Recovery
1	Complete recovery, AF free	Right	Dyspnea, pulmonary infection	During RSPV isolation	12 months
2	Complete recovery, AF free	Right	Dyspnea	Immediately after procedure	12 months
3	Complete recovery, AF free	Right	Dyspnea, pulmonary infection	During RSPV isolation	7 months
4	Complete recovery, AF free	Right	Dyspnea	Immediately after procedure	4 months
5	Complete recovery, AF free	Right	None on systematic chest X-ray	After procedure	12 days
6	Complete recovery, AF free	Right	Dyspnea	After procedure	4 months
7	Complete recovery, AF free	Right	Dyspnea	During SVC disconnection	3 months
8	Complete recovery, AF free	Left	None on fluoroscopy	During LAA foci ablation	1 day
9	Complete recovery, AF free	Left	Dyspnea, hiccup	During LAA foci ablation	1 day
10	Complete recovery, AF recurrence	Right	None on fluoroscopy	During SVC disconnection	1 day
11	Complete recovery, AF recurrence	Right	Dyspnea on fluoroscopy	Before energy delivery	19 months
12	Complete recovery, AF recurrence	Right	Dyspnea and pleural effusion	During SVC disconnection	6 months
13	Partial recovery, AF free	Right	None on systematic chest X-ray	After procedure	6 months
14	Partial recovery, AF free	Right	Dyspnea, pleural effusion, atelectasis, and fever	Immediately after procedure	13 months
15	Partial recovery, AF recurrence	Right	Dyspnea on exertion	Immediately after procedure	6 months
16	No recovery, AF free	Right	Dyspnea	Immediately after procedure	—
17	No recovery, AF free	Right	Cough and dyspnea	During RSPV isolation	—
18	No recovery, AF recurrence	Right	Thoracic pain and dyspnea	2 Days after procedure	—
Totals	12 Complete recovery 3 Partial recovery 3 No recovery	16 Right 2 Left	4 None 14 Dyspnea	9 During procedure 5 Immediately after procedure 4 Later	6 ± 6 months

(J Am Coll Cardiol 2006;47:2498–503)

Pulmoner ven stenozu

- AF ablasyon sonrası ilk defa 2000 yılında tanımlanmış
- Hafif < %50, Orta %50-70, Ciddi >%70
- Sıklığı gittikçe azalıyor (% 1-3)
  - PV dışında verilmesi (antral)
  - Elektroanatomik haritalama

- Konjenital
- Akiz
  - Pulmoner ven ablasyon
  - Sarkoidoz
  - Malinite
  - Fibrozan mediastenit
  - Kardiyovasküler cerrahi sonrası

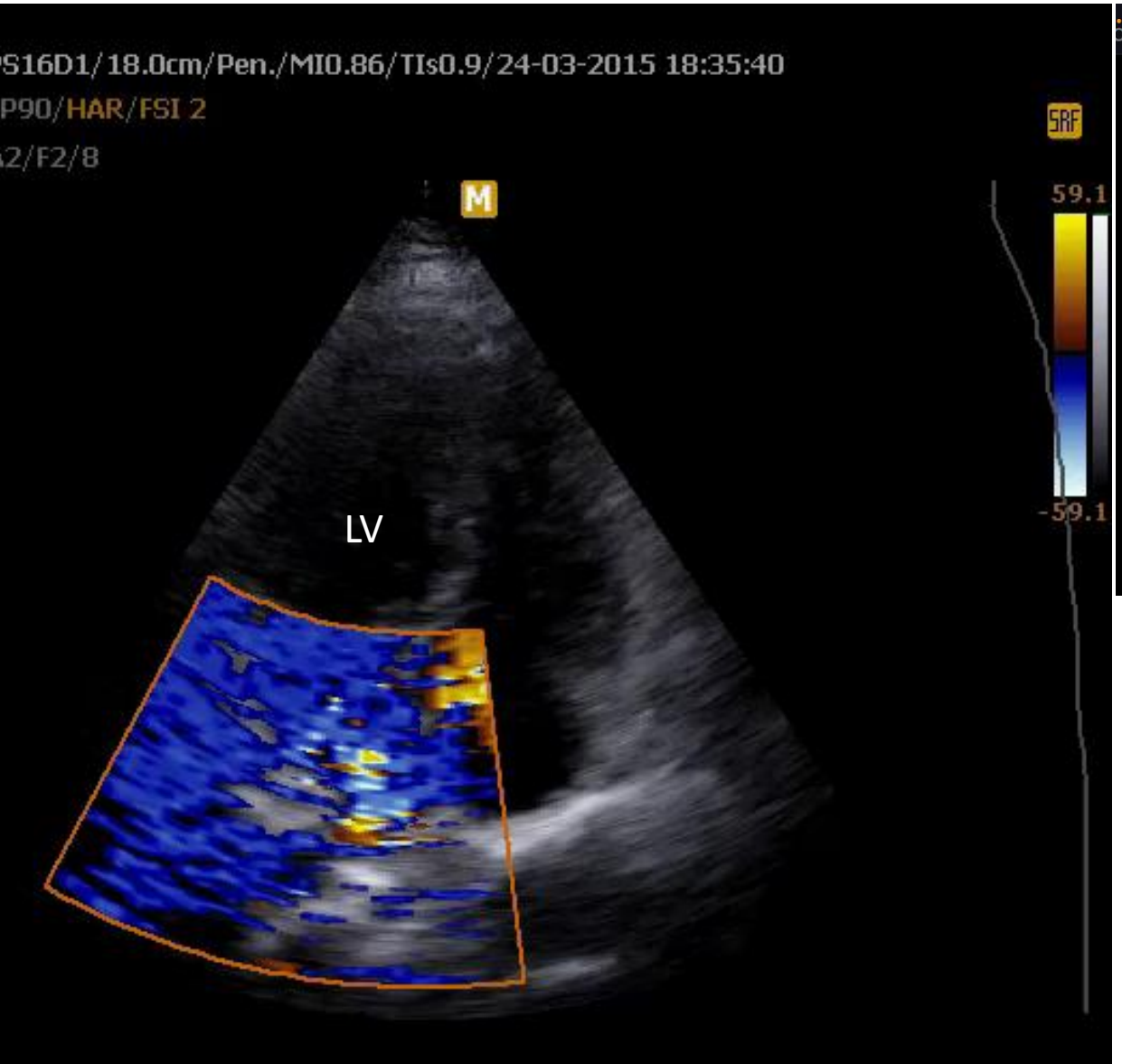
Complications of Atrial Fibrillation Ablation
When Prevention Is Better Than Cure
Antonio Sorgente; Gian-Battista Chierchia; Carlo de Asmundis; Andrea Sarkozy; Lucio Capulzini; Pedro Brugada
Europace. 2011;13(11):1526-1532.

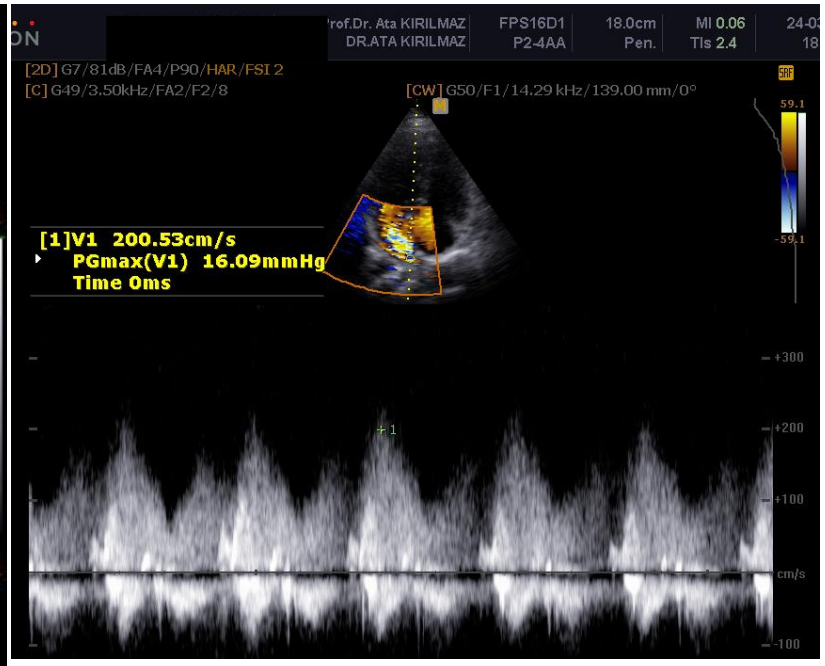
Pulmoner ven stenozu semptomları

- Öksürük
- Dispne
- Göğüs ağrısı
- Hemoptizi
- Tekrarlayan solunum yolu enfeksiyonları
- Pulmoner hipertansiyon
- Asit
- Tutulan PV sayısı ve stenoz derecesi

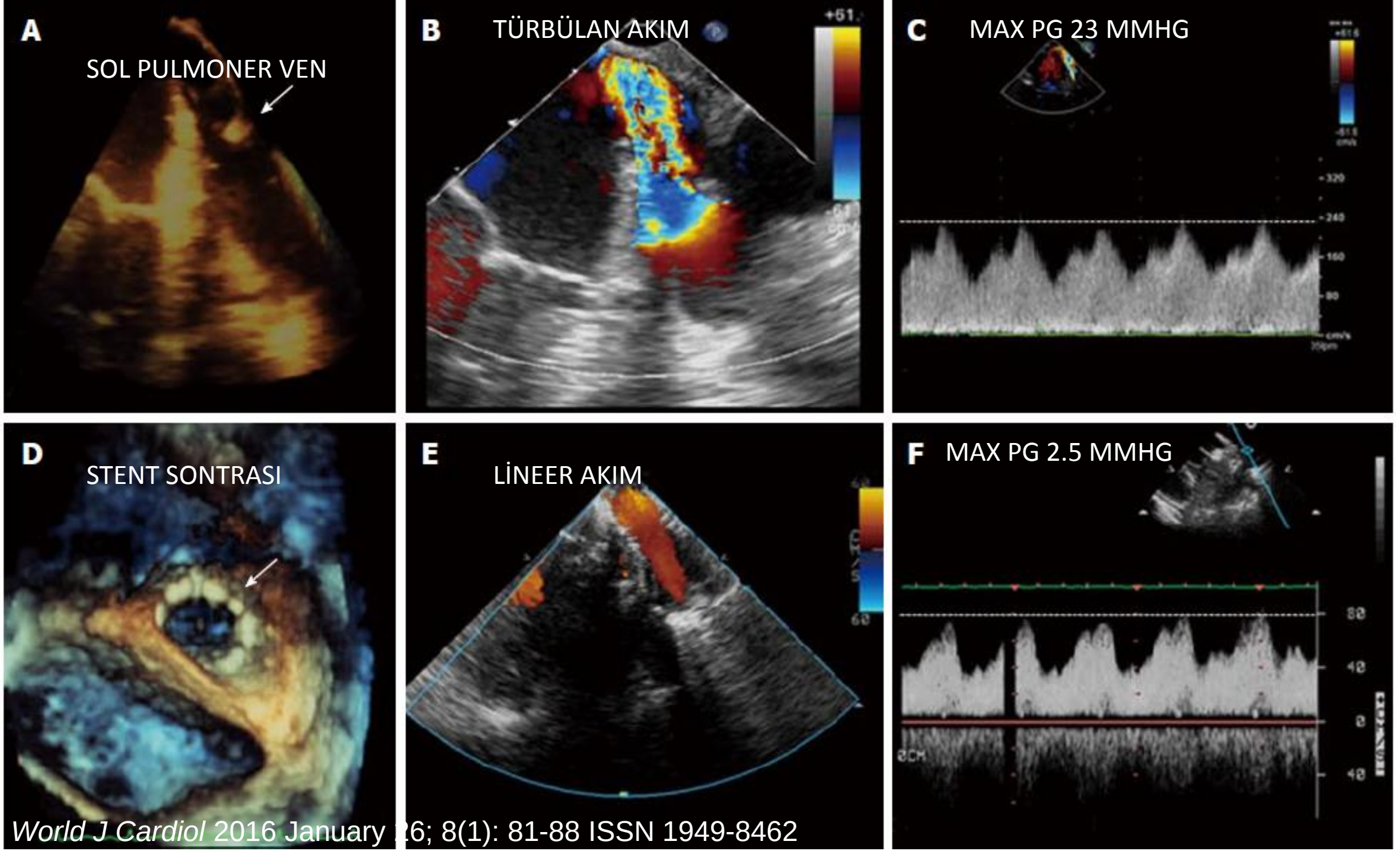
Tanı

- Transtorasik EKOKARDİYOGRAFİ

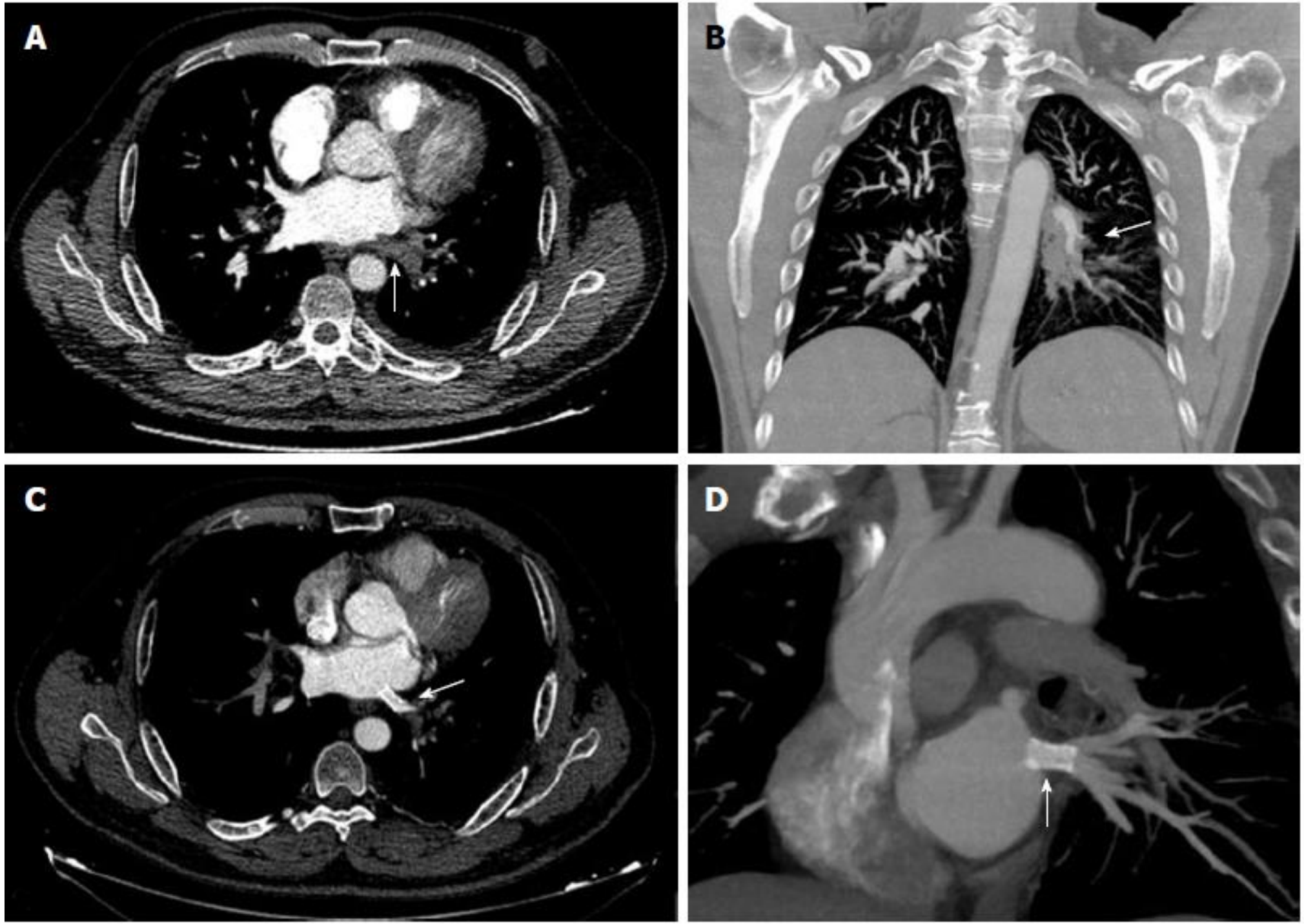




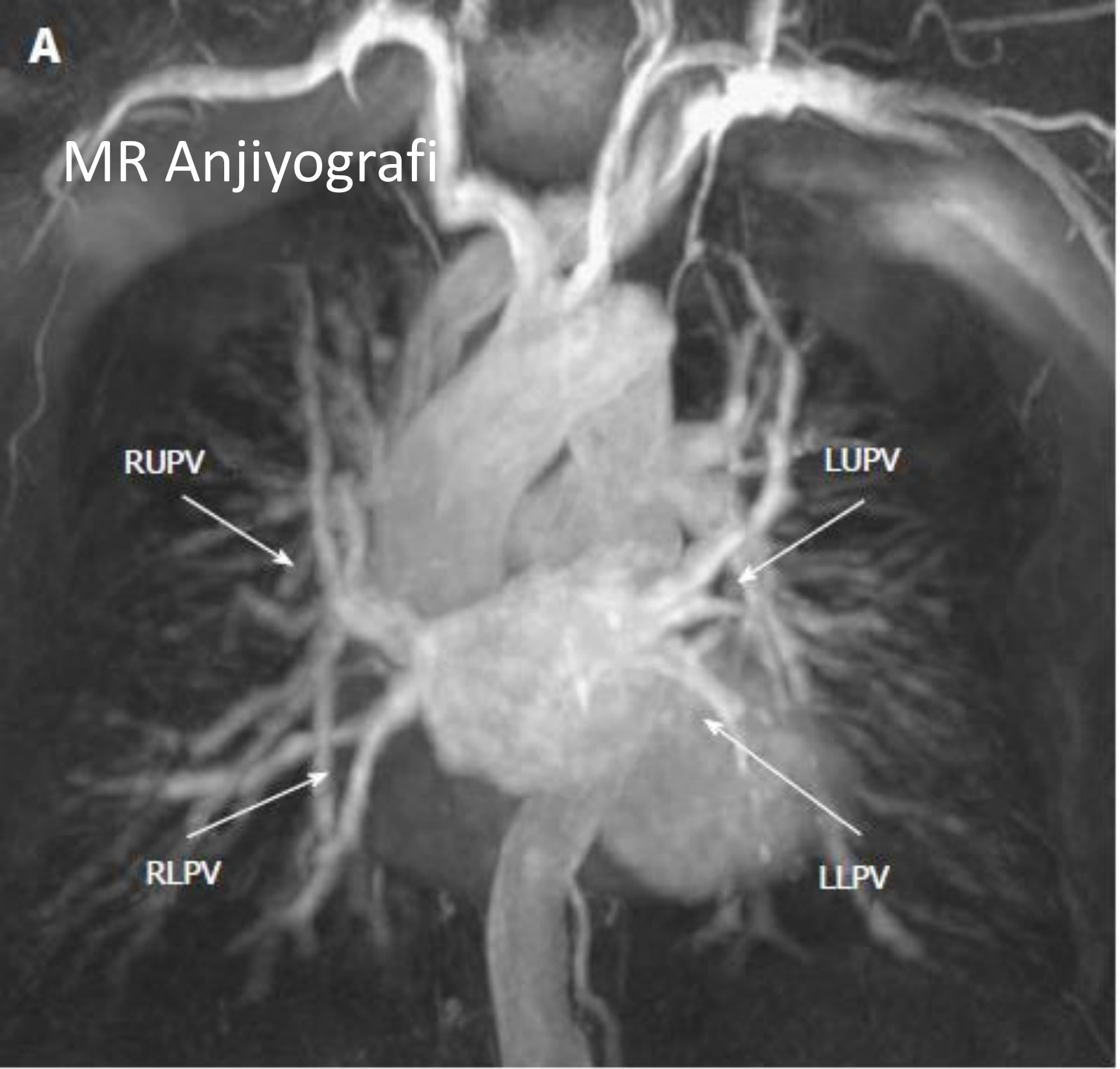
SAĞ VENTRİKÜL ve ATRİAL DİLATASYON
TRİKÜSPİD YETMEZLİK
YÜKSEK PULMONER ARTER BASINCI

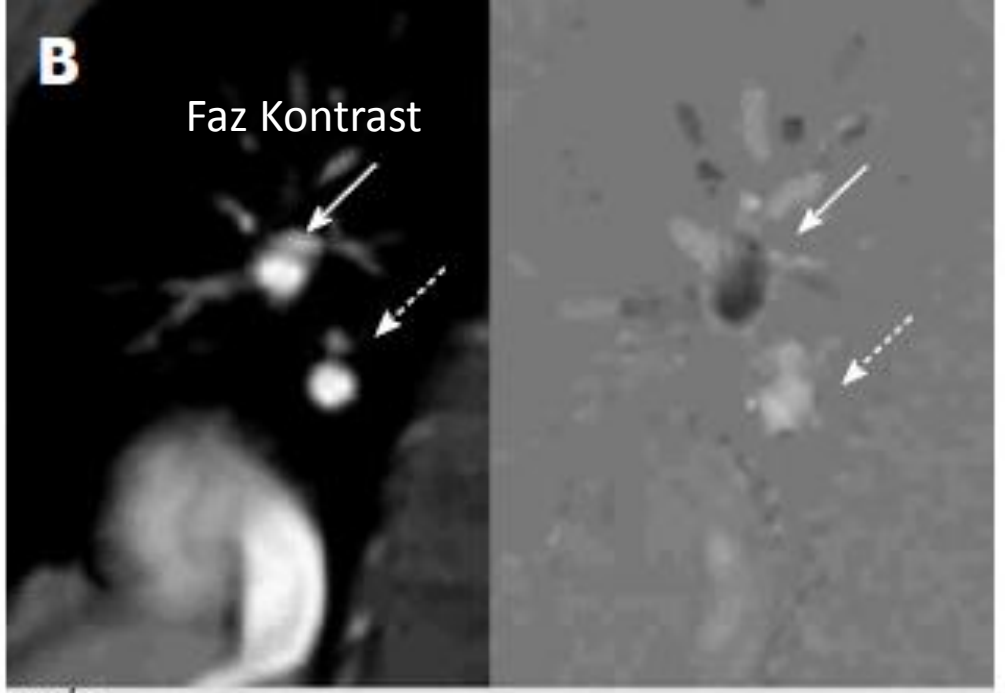


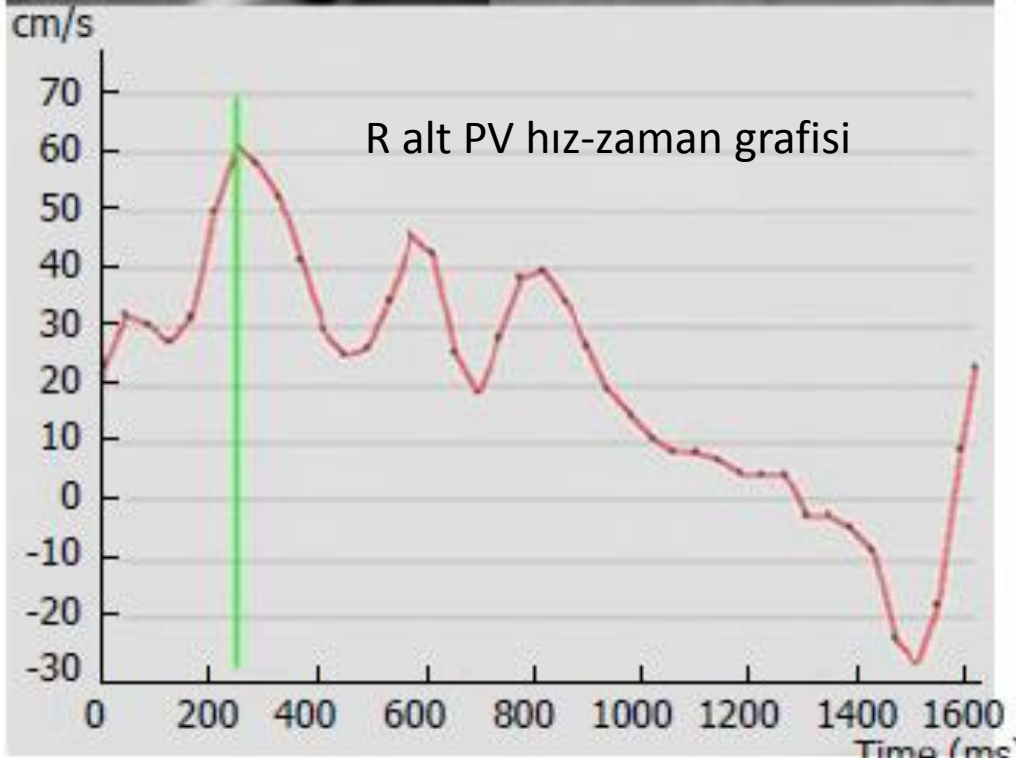
World J Cardiol 2016 January 26; 8(1): 81-88 ISSN 1949-8462


A
B
C
D

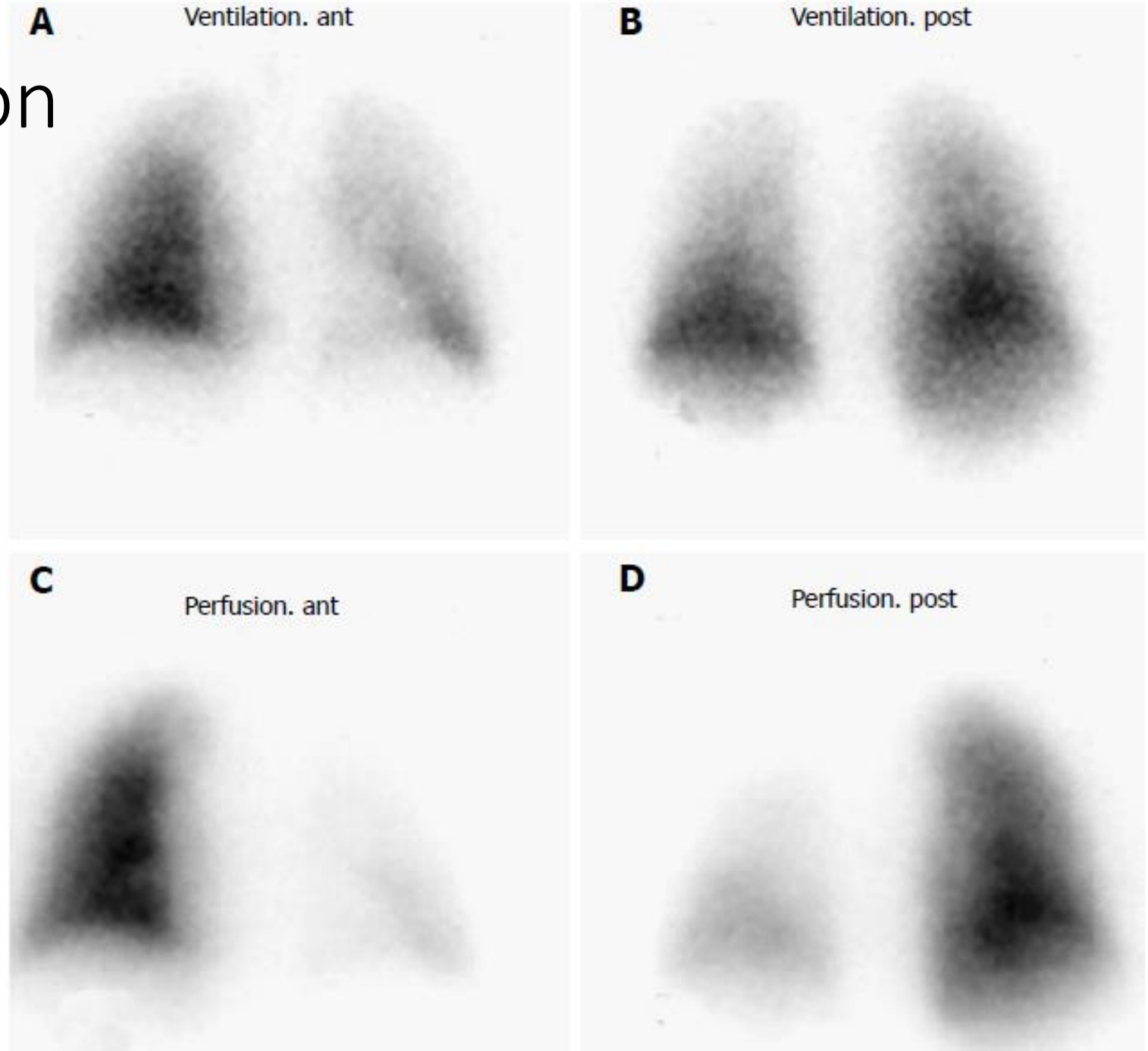
PULMONER BT ANJİOGRAFİ:13/03/2009 BT, TORAKS:13/03/2009 BT, ANJİYOGRAFİ, TEK ANATOMİK BÖLGE İÇİN:13/03/2009TORAKS BT Mediastinal yağ dokusunun dansitesi artmıştı Her iki akciğerde yaygın buzlu cam dansite artışı vardır. İnterlobüler septumlar ve bronş duvarları kalındır. Bulgular akciğer ödemini düşündürmüştür.Sağ üst lobda periferik konsolidasyon dikkati çekmiştir.Bilateral plevral effüzyon mevcuttur.Kalp ve mediastinal büyük damar yapıları normaldir. Trakea ve proksimal bronşlar açıktır.Göğüs duvarı kemik yapıları ve yumuşak dokuları normal olarak eğerlendirilmiştir.Batında asit saptanmıştır.PULMONER ARTER BT ANJİYOGRAFİPulmoner arterler normal genişliktedir. Emboli saptanmamıştır.Sağda daha belirg olmak üzere bilateral pulmoner ven rifislerinde stenoz dikkati çekmiştir.SONUÇ: Plevral effüzyon, akciğer ödemi, pulmoner ven orifisleridne stenoz, sağ akciğerde pnömoni veya infarktla uyumlu periferal konsolidasyon, asit


A
MR Anjiyografi
RUPV
LUPV
RLPV
LLPV


B
Faz Kontrast

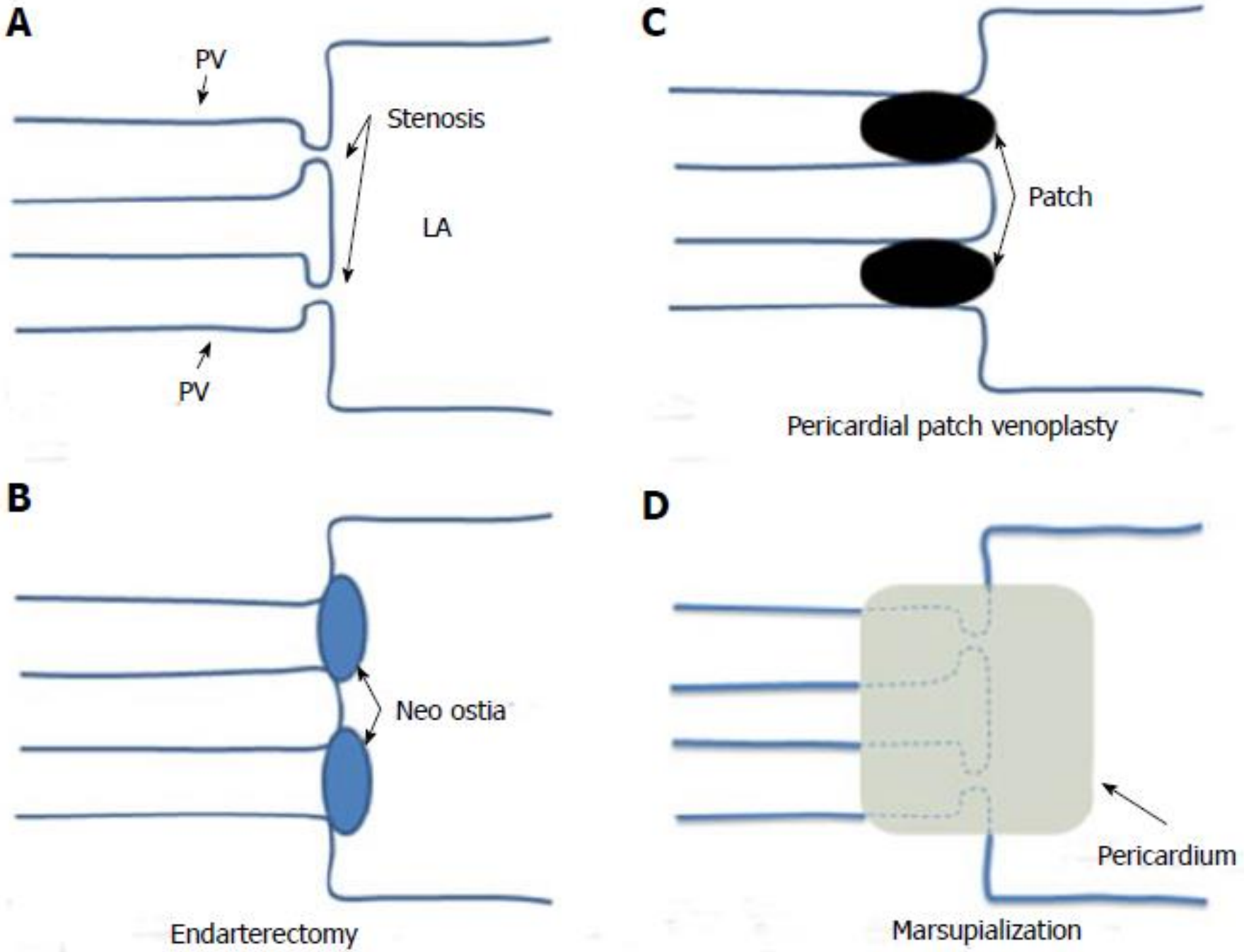

cm/s
70
60
50
40
30
20
10
0
-10
-20
-30
0
200
400
600
800
1000
1200
1400
1600
Time (ms)
R alt PV hız-zaman grafisi

Ventilasyon/perfüzyon Sintigrafisi



PV stenoz tanısında görüntüleme

	TEE	CT	MRI	V/P
Ulaşılabilirlik	Evet	evet	Hayır	hayır
Non-invazif	Hayır	Evet	Evet	Evet
Direkt ölçüm	Hayır	Evet	Evet	Hayır
Fonksiyonel ölçüm	Evet	Hayır	Evet	Evet
Çevre dokuların değerlendirilmesi	Hayır	Evet	Evet	Hayır
Radyasyondan kaçınma	evet	Hayır	Evet	Hayır


A
PV
Stenosis
LA
PV
C
Patch
Pericardial patch venoplasty
B
Neo ostia
Endarterectomy
D
Pericardium
Marsupialization

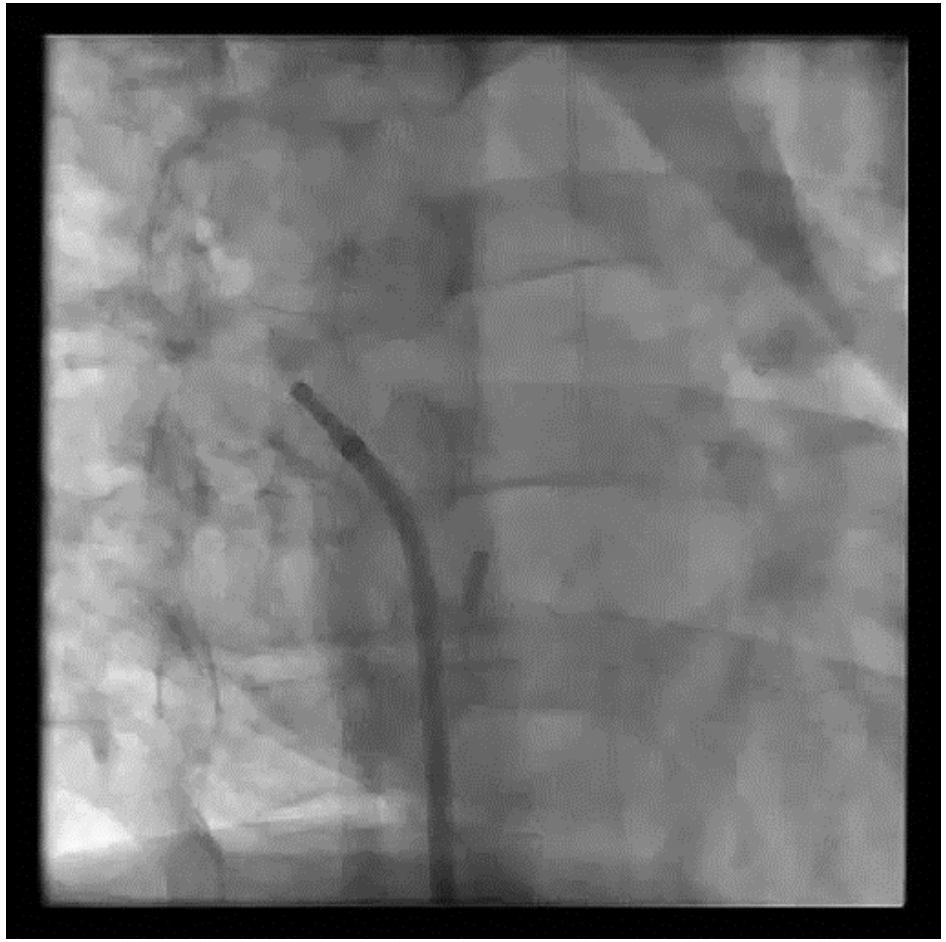
Circulation

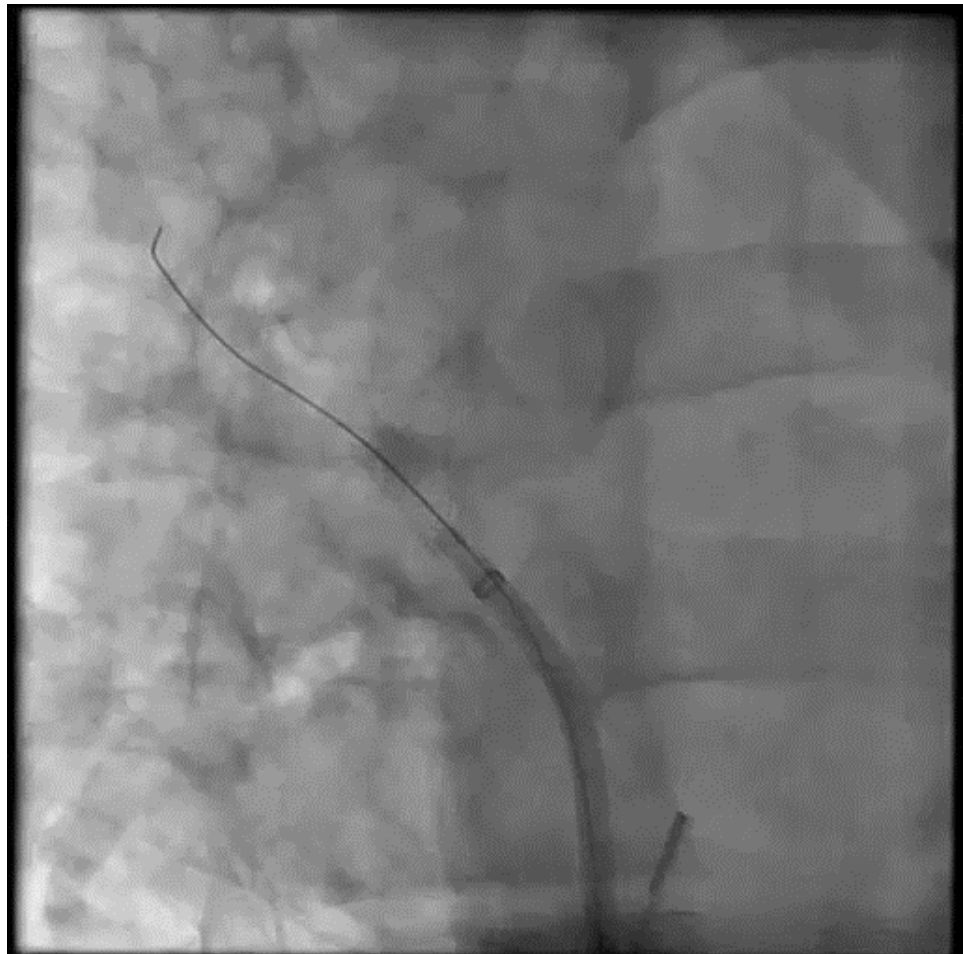
ORIGINAL RESEARCH ARTICLE

Severe Pulmonary Vein Stenosis Resulting from Ablation for Atrial Fibrillation: Presentation, Management and Clinical Outcomes

Erin A. Fender, R. Jay Widmer, David O. Hodge, George M. Cooper, Kristi H. Monahan, Laura A. Peterson, David R. Holmes, Douglas L. Packer

Restenoz oranı %30-50





vein stenosis - stenting post ablation - Prof Darren Walters

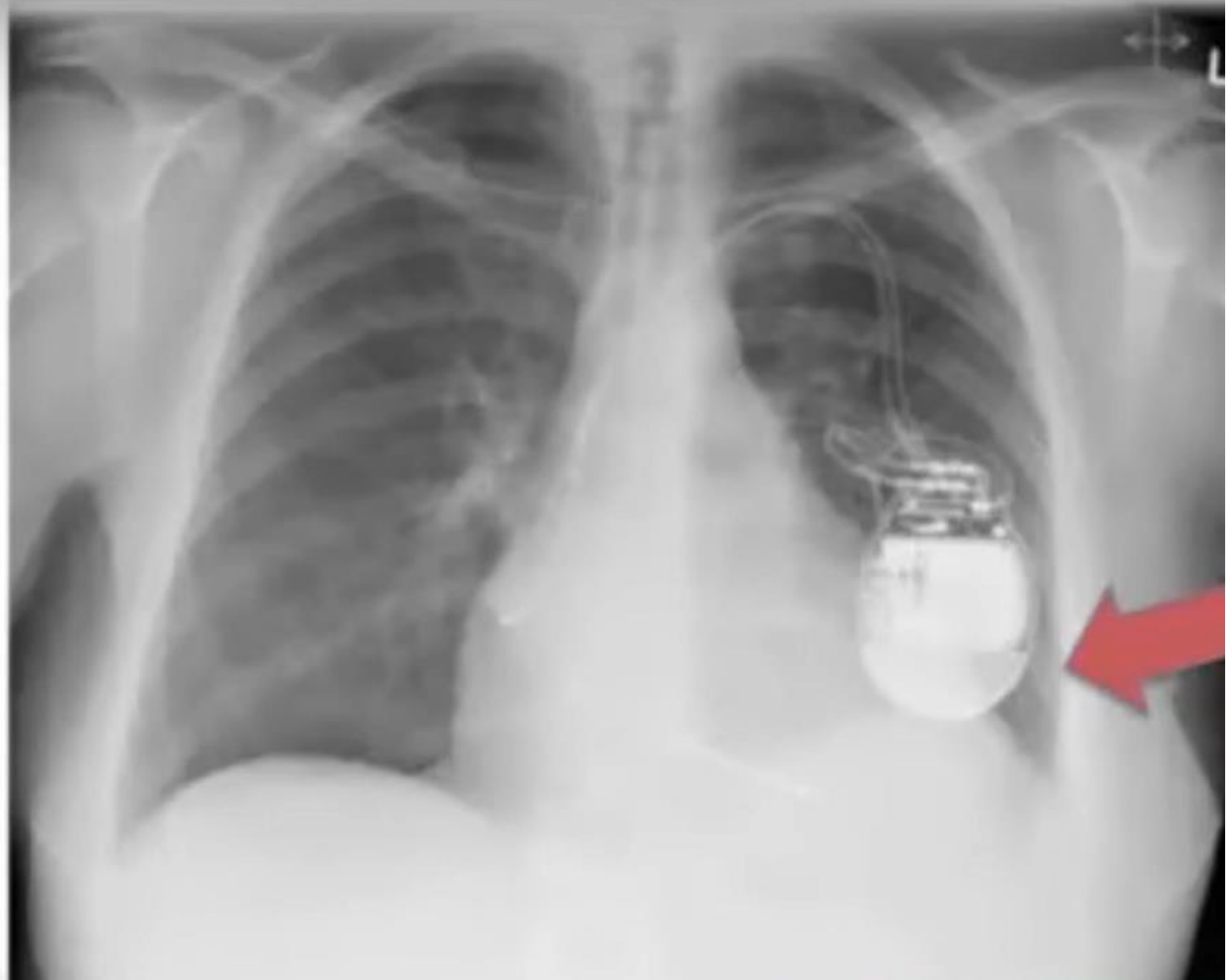
Chest XRAY

Left hemidiaphragm is obscured, suggestive of collapse or consolidation

Right lung field is clear

Increased cardiothoracic ratio

AICD in situ



Cryoballoon Ablation of Pulmonary Veins for Paroxysmal Atrial Fibrillation

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

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Pulmoner ven stenoz oranı % 3.1

~~23 mm çap~~

Frenik sinir paralizisi %11.2

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