



LV Summit Kaynaklı VES/VT Ablasyonları

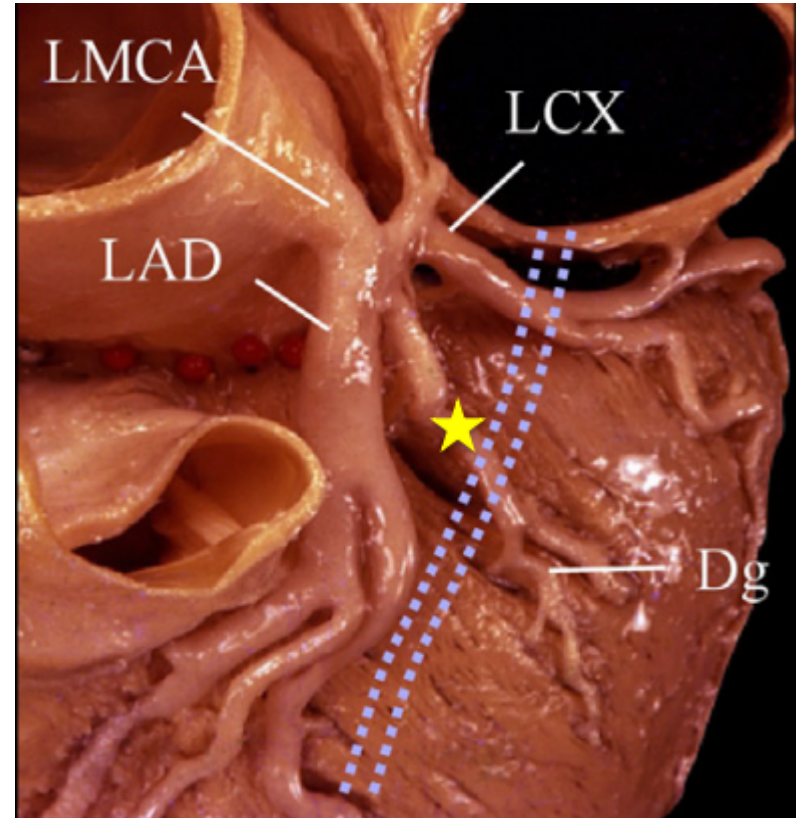
Doç. Dr. Hasan Koca

Adana Şehir Eğitim ve Araştırma Hastanesi

11. Atriyal Fibrilasyon Zirvesi 2022

- **LV Summit tanım genel bilgiler**
- **LV Summit anatomisi**
- **LV Summit komşulukları**
- **LV Summit EKG**
- **Ablasyon güncel kılavuz bilgileri**
- **Ablasyon-Haritalama önemli noktalar**
- **LV Summit güncel bilgiler**
- **LV Summit ablasyon gelecek yöntemler ve beklentiler**
- **Eve götürülecek mesajlar**

- LV summit; sol ventrikül epikardiyal bölgesinin en tepesinde yer alan sol ana koroner arterin 2 ana dalı ile sınırlı epikardiyal adipoz dokudan ve vasküler yapılardan zengin üçgen bir alandır.
- İdiyopatik VES/VT yaklaşık %10'u epikardiyal bunların büyük bir kısmı LV Summit kaynaklı.

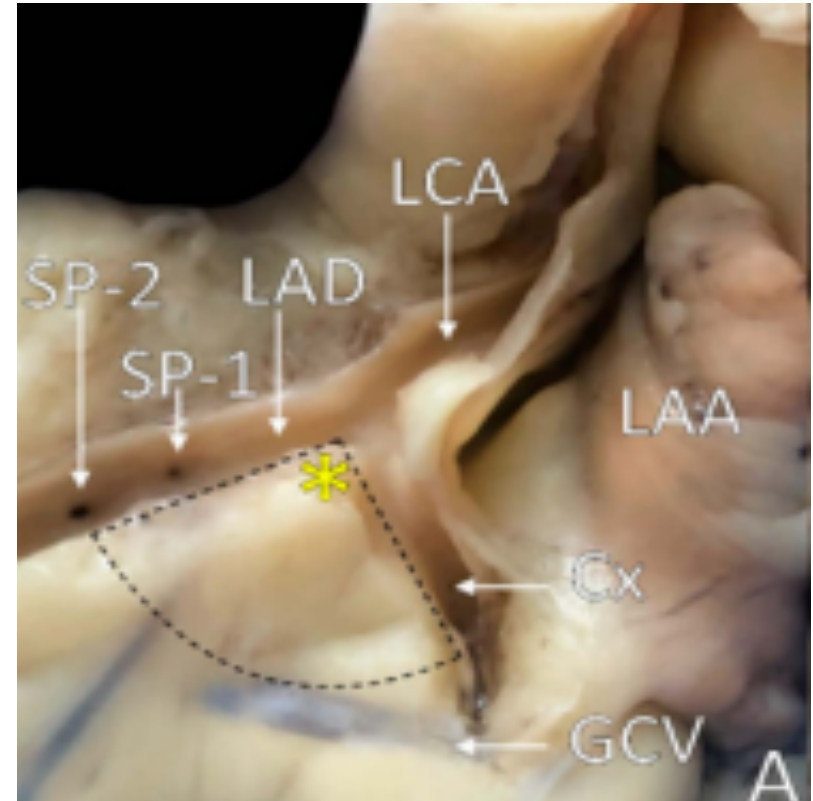
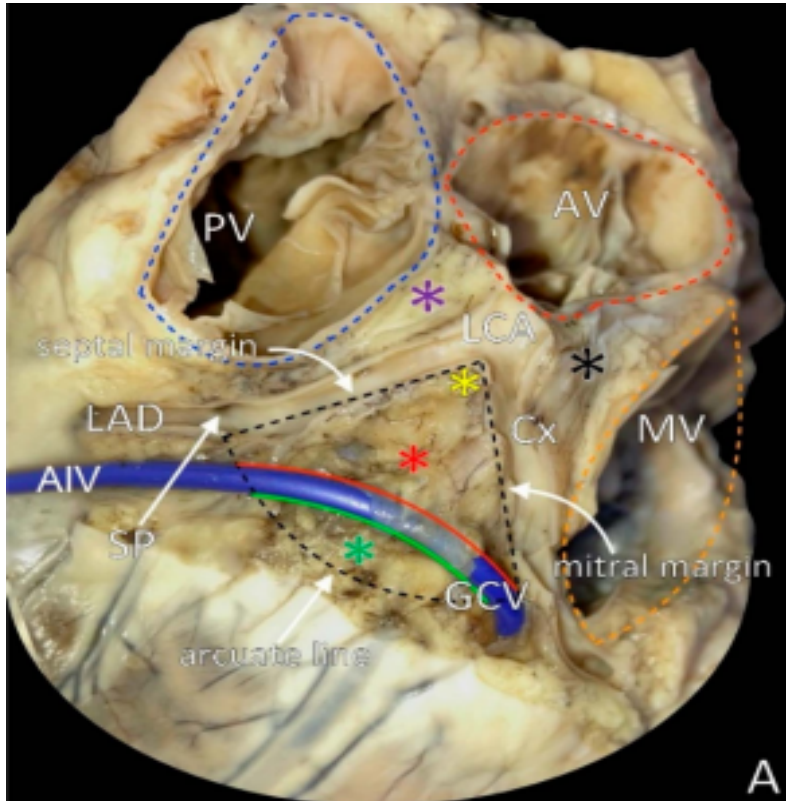


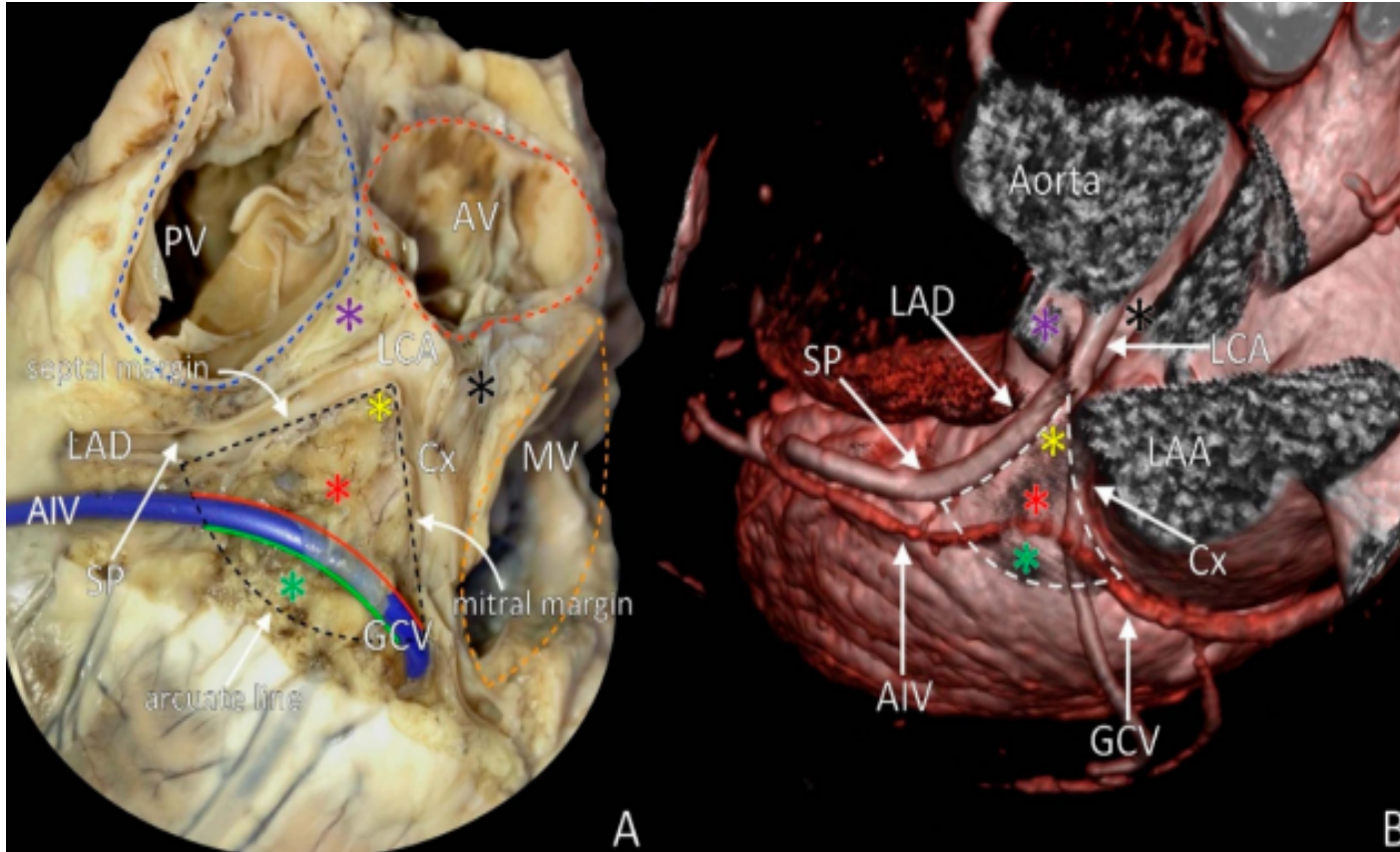
Ventricular tachycardia originating from the “Bermuda Triangle”

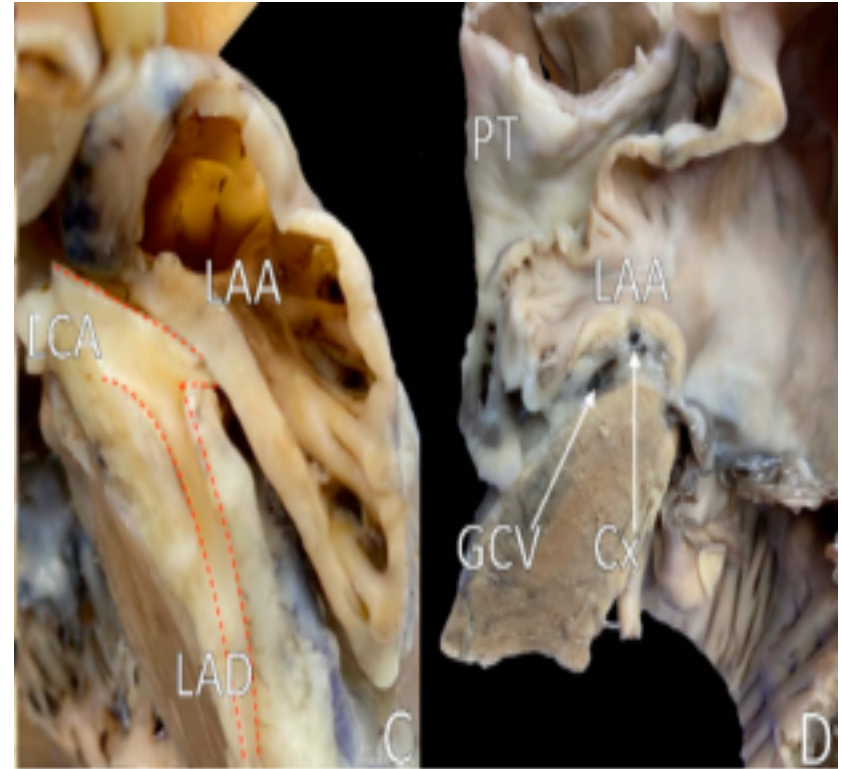
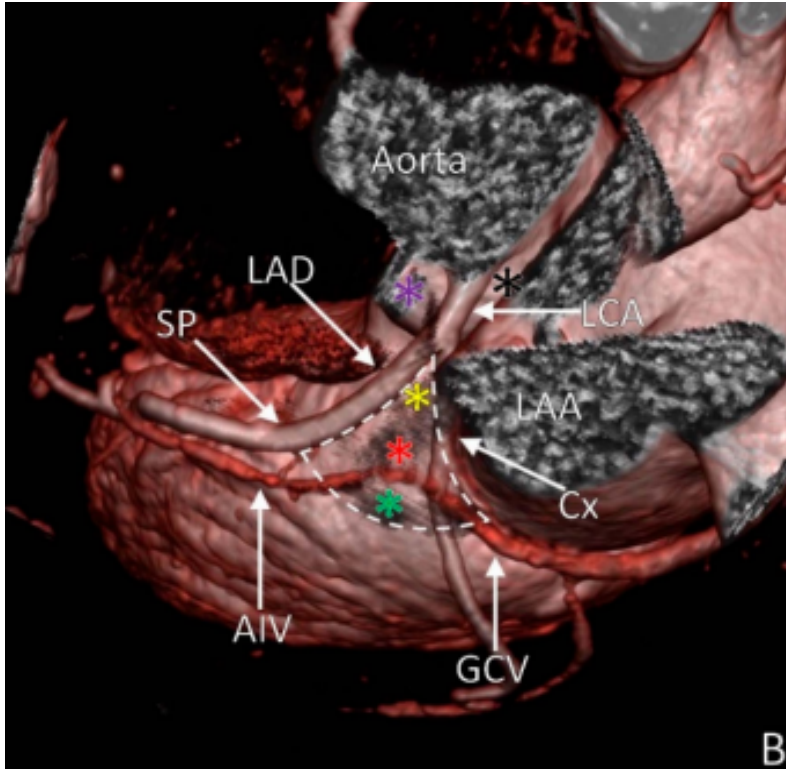
David R. Altmann^a, Sven Knecht^b, Christian Sticherling^b, Peter Ammann^a, Stefan Osswald^b, Michael Kühne^b

^a Cardiology, Kantonsspital St. Gallen, Switzerland

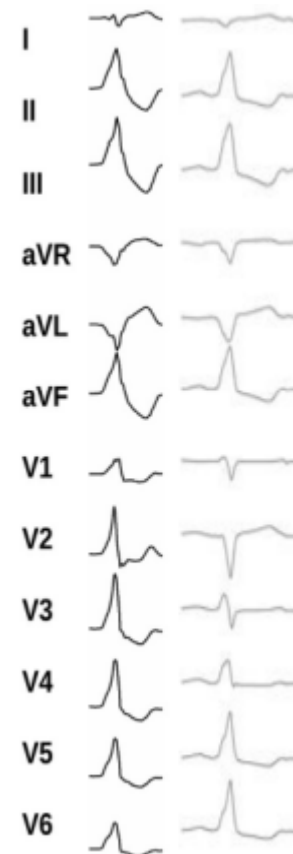
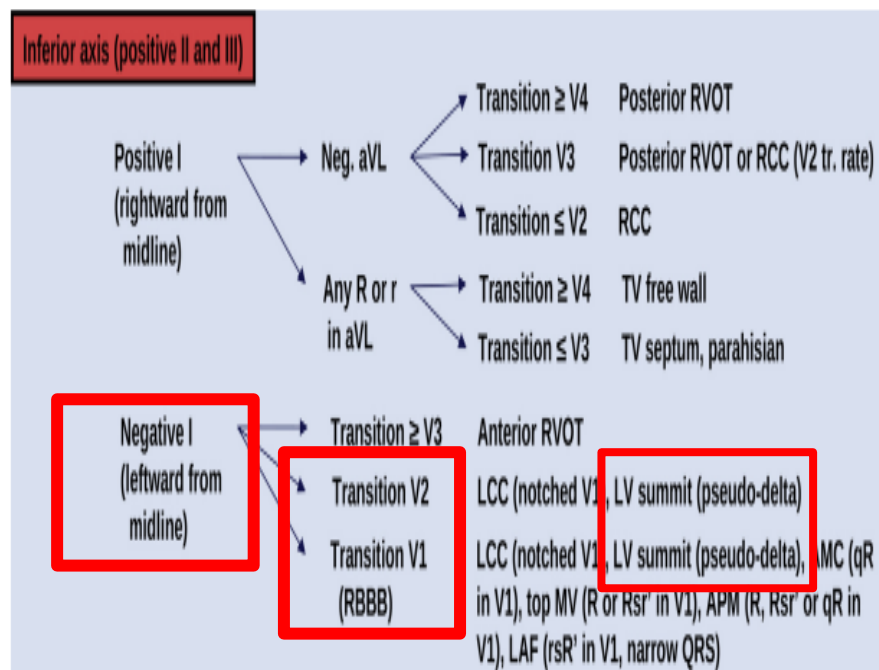
^b Cardiology/Electrophysiology, University Hospital Basel, Switzerland







- RBBB veya LBBB olabilir.
- inferior aks
- D1 QS (%30)
- Psödo-delta




- LBBB
- Transizyon daha geç olması
- QRS süresi daha kısa (<175 msn)
- R dalgası $D2 > D3$
- Q dalgası $aVR > aVL$
- $MDI > 0.55$

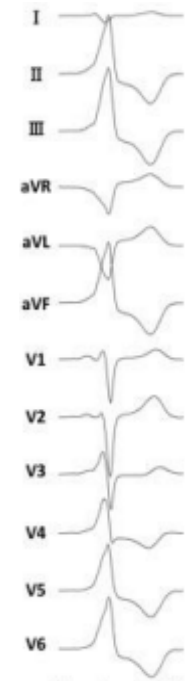
Bazal (inaccessible) Summit lehine başarı oranı düşük!!!

Original Article

Outcomes of Catheter Ablation of Idiopathic Outflow Tract Ventricular Arrhythmias With an R Wave Pattern Break in Lead V2: A Distinct Clinical Entity

TATSUYA HAYASHI M.D., PASQUALE SANTANGELI M.D., Ph.D., RAJEEV K. PATHAK M.B.B.S., Ph.D., DANIELE MUSER M.D., JACKSON J. LIANG D.O., SIMON A. CASTRO M.D. ... See all authors 

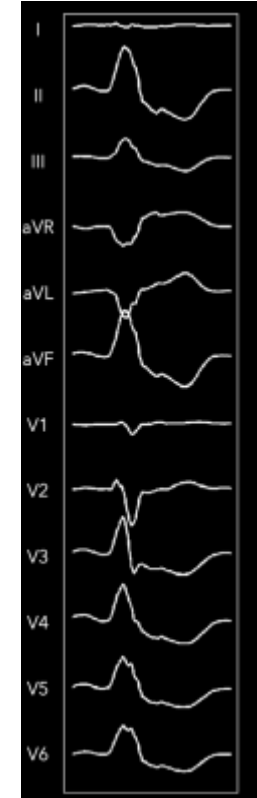
First published: 24 February 2017 | <https://doi.org/10.1111/jce.13183> | Citations: 32



Left ventricular summit arrhythmias with an abrupt V₃ transition: Anatomy of the aortic interleaflet triangle vantage point ^e

Hongtao Liao, MD,^{*†1} Wei Wei, MD, PhD,^{*1} Kevin S. Tanager, MD,[†] Frank Miele, AS,[‡] Gaurav A. Upadhyay, MD, FHRS,[‡] Andrew D. Beaser, MD,[‡] Zaid Aziz, MD,[‡] Hemal M. Nayak, MD, FHRS,[‡] Cevher Ozcan, MD,[‡] Takuro Nishimura, MD, PhD,[‡] Ruhong Jiang, MD,[‡] Dalise Shatz, BA,[‡] Aliya N. Husain, MD,[†] Roderick Tung, MD, FHRS^{*‡}

From the ^{}Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Provincial Key Laboratory of South China Structural Heart Disease, Guangdong Academy of Medical Sciences, Guangzhou, P.R. China, [†]Department of Pathology, Department of Medicine, Center for Arrhythmia Care, Pritzker School of Medicine, The University of Chicago Medicine, Chicago, Illinois, and [‡]Section of Cardiology, Pritzker School of Medicine, The University of Chicago Medicine, Chicago, Illinois.*



| | Ablasyon | Beta-Bloker | KKB | Flekainid | Amiodaron |
|---|------------------|-------------|------------------------|------------------------|-----------|
| RVOT/fascicular PVCVT: Symptomatic, normal LV function | Class I | Class IIa | Class IIa | Class IIa | Class III |
| RVOT/Fasiküler dışı VES/VT: Semptomatik, normal LV fonksiyon | Class IIa | Class I | Class I | Class IIa | Class III |
| RVOT/fascicular PVCVT: LV dysfunction | Class I | Class IIa | Class III ^a | Class IIa ^b | Class IIa |
| RVOT/Fasiküler dışı VES/VT: LV disfonksiyon | Class I | Class IIa | Class III ^a | Class IIa ^b | Class IIa |
| PVC: Burden >20%, asymptomatic, normal LV function | Class IIb | | | | Class III |

1. Direkt ablasyon

- Epikardiyal

2. İndirekt ablasyon

- GCV/AIV
- RVOT
- LCC (RCC/Junction)
- LV endokard
- LAA

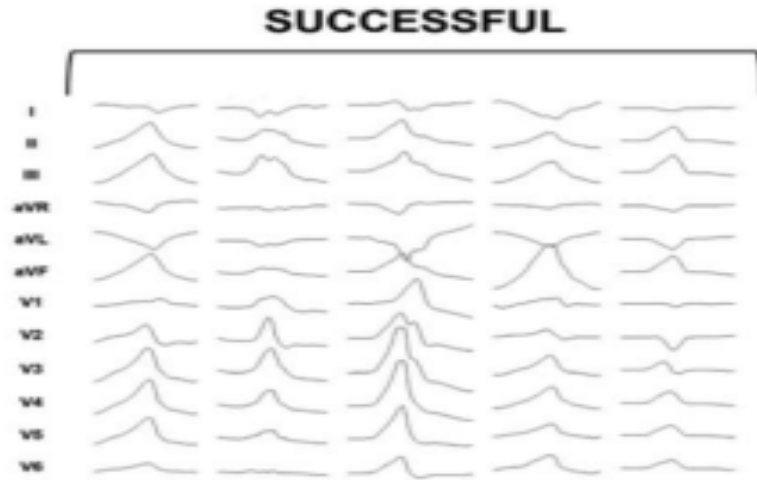
Original Article

- Epikardiyal girişim son seçenek olmalı!!!
- Akut başarı %20
- Başarılı epikardiyal ablasyon EKG prediktörleri:

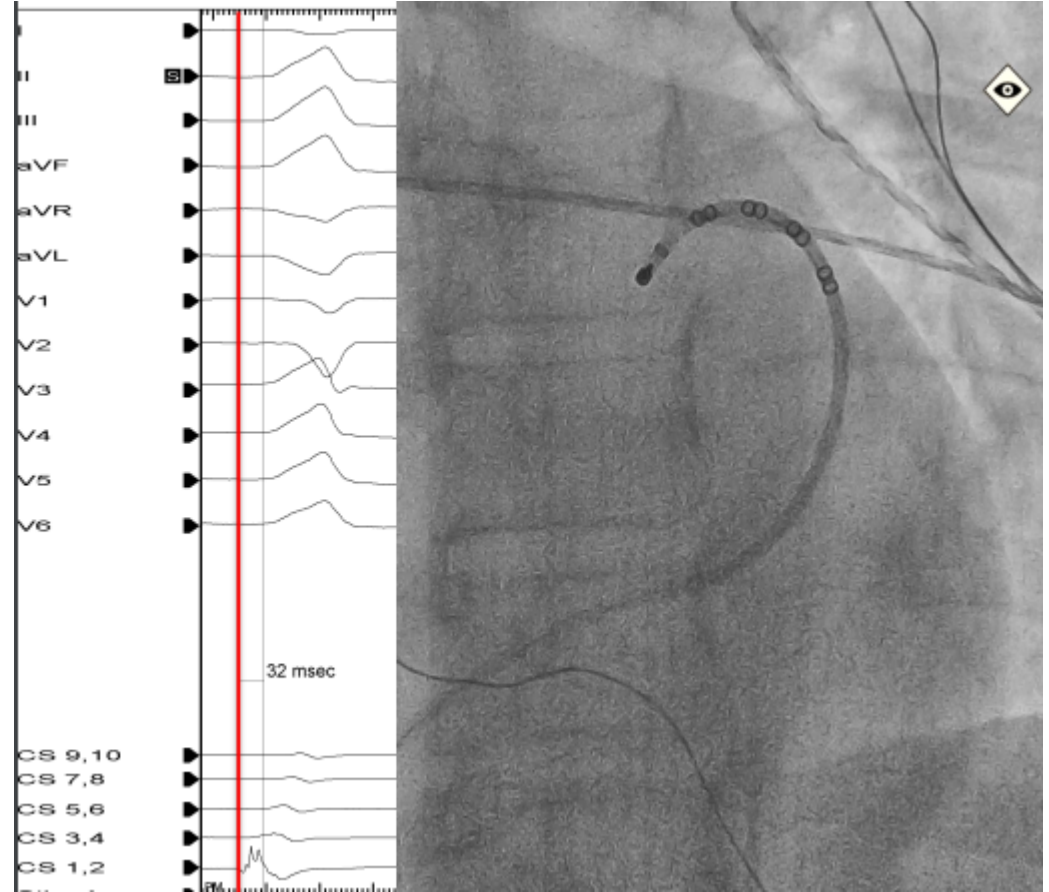
1. aVL/Avr Q ratio >1.85
2. V1 R/S >2
3. V1 başlangıç q olmaması

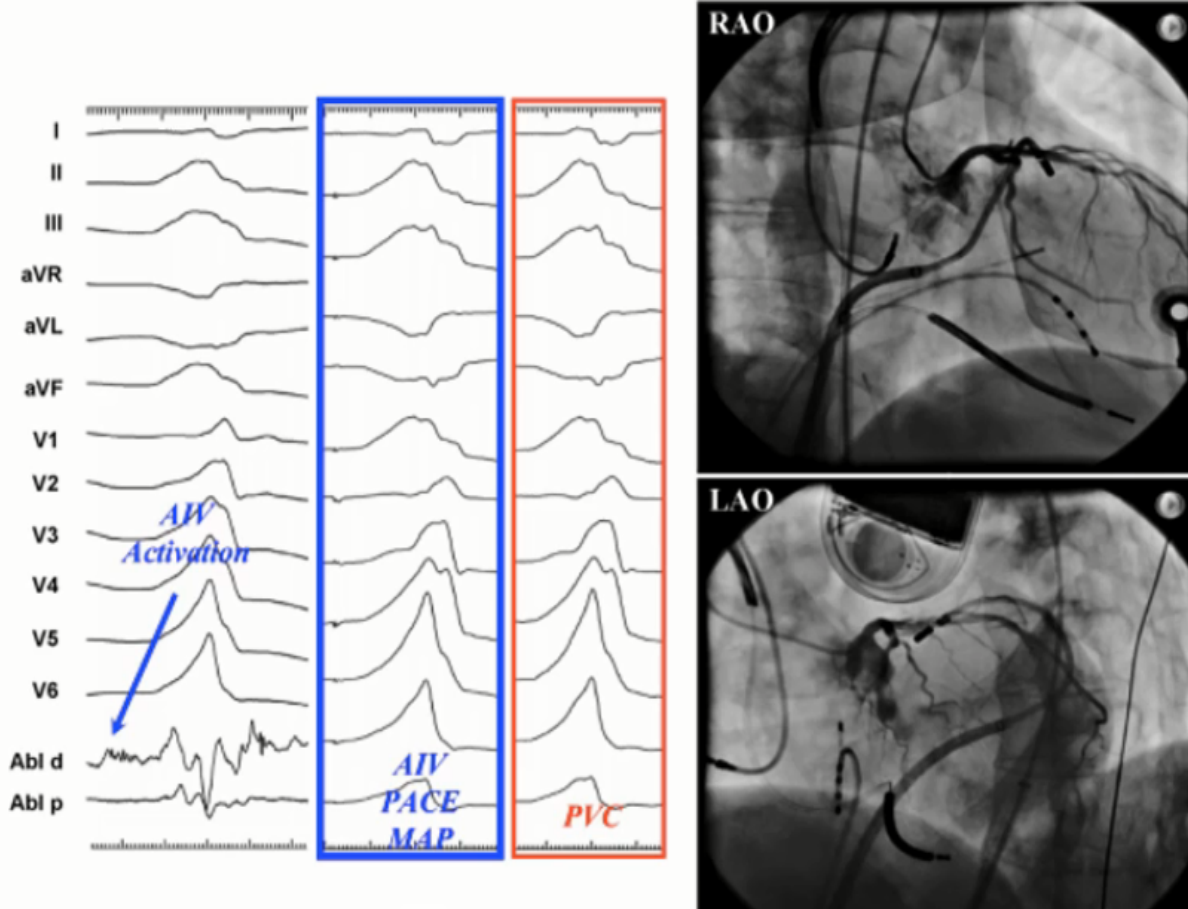
Percutaneous Epicardial Ablation of Ventricular Arrhythmias Arising From the Left Ventricular Summit Outcomes and Electrocardiogram Correlates of Success

Pasquale Santangeli, MD; Francis E. Marchlinski, MD; Erica S. Zado, PA-C; Daniel Benhayon, MD; Mathew D. Hutchinson, MD; David Lin, MD; David S. Frankel, MD; Michael P. Riley, MD, PhD; Gregory E. Supple, MD; Fermin C. Garcia, MD; Rupa Bala, MD; Benoit Desjardins, MD, PhD; David J. Callans, MD; Sanjay Dixit, MD

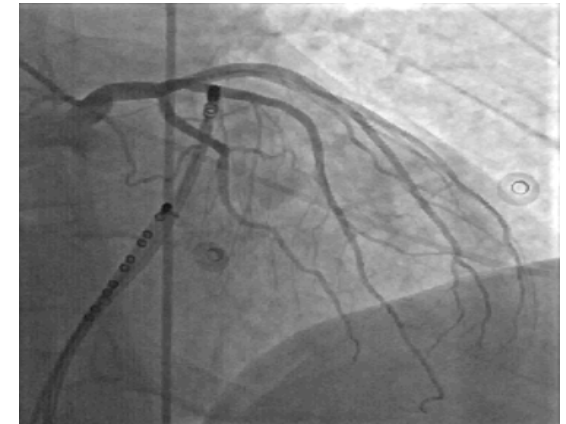
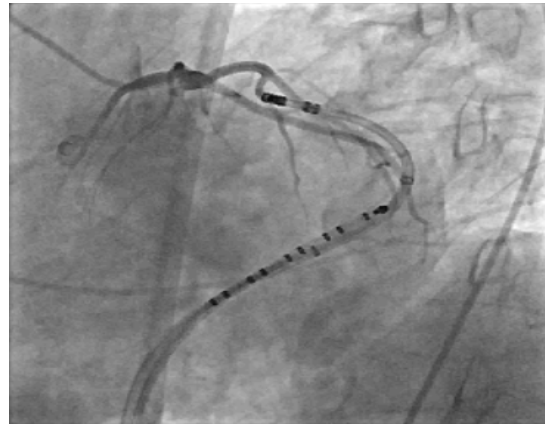
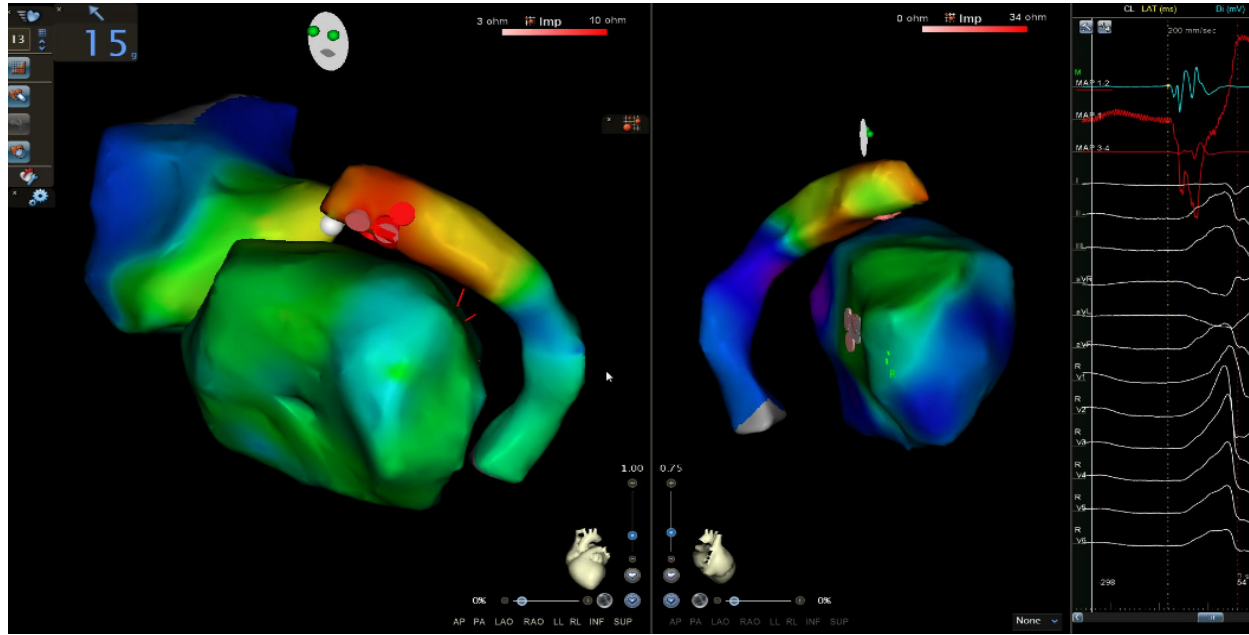


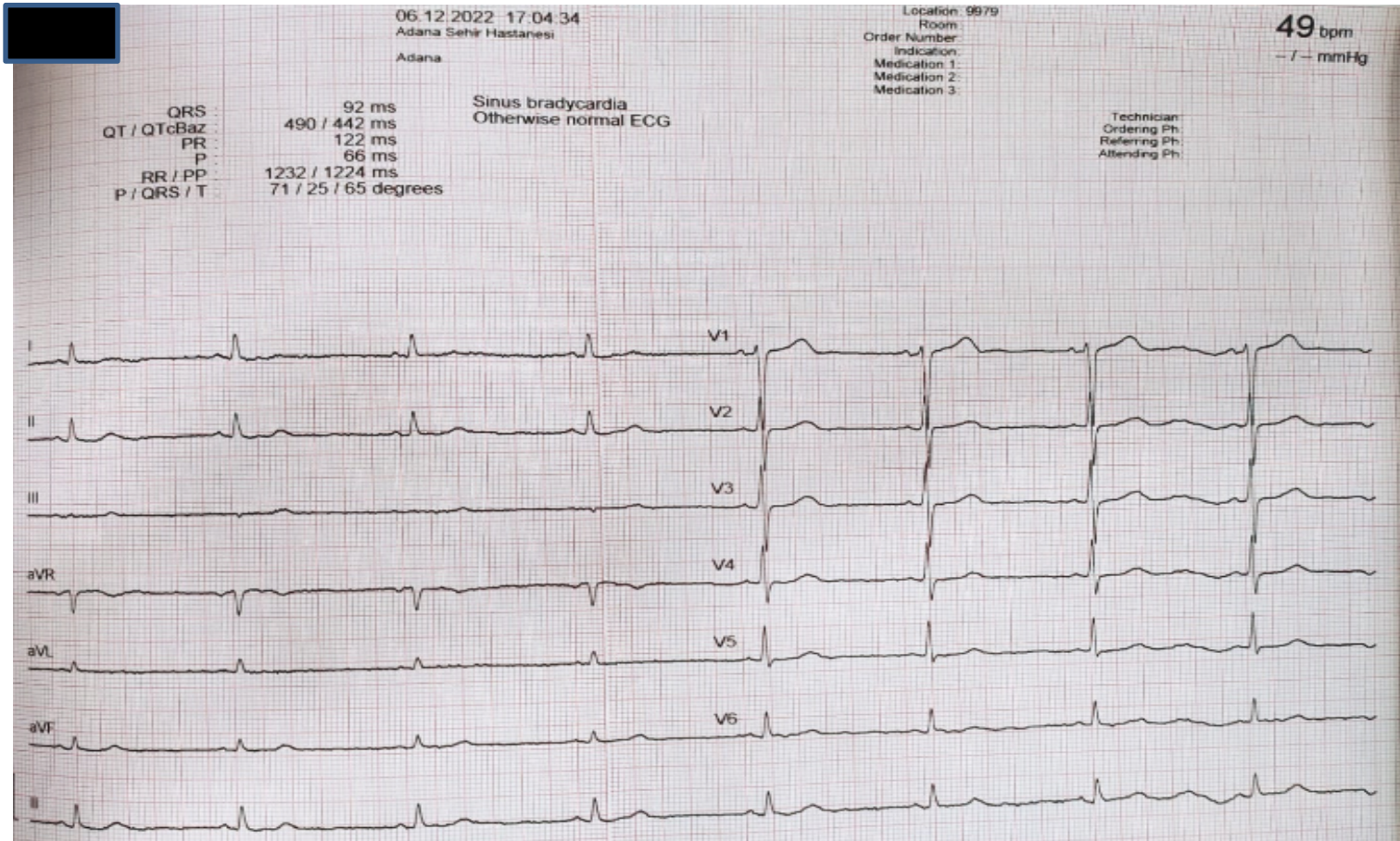
- LV summit ablasyonda ideal tercih (GCV)
- CS kateteri mutlaka en distale ilerletilmeli
- CS ilerletilmesinde sorun yaşanırsa uzun yönlendirilebilir sheat veya sıvı yüklemesi
- Bu bölgeye ablasyon yapmadan önce koroner anjio
- AIV damar çapı küçük ve LAD komşuluğu dikkat!!!

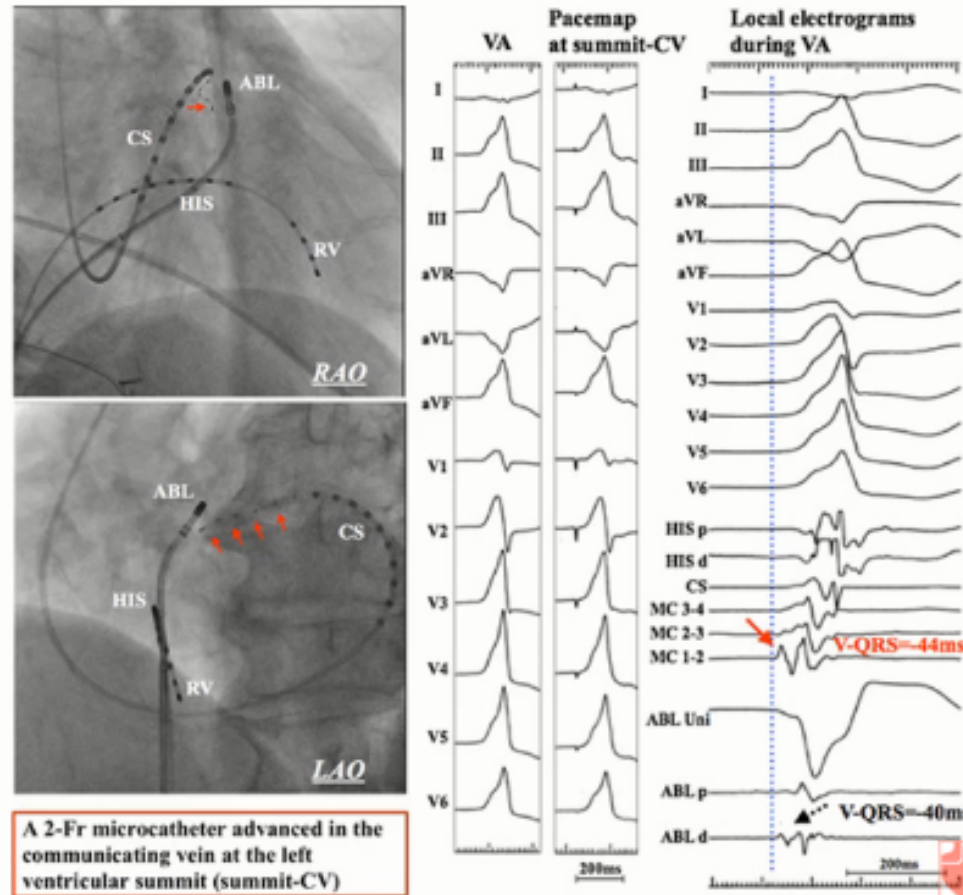


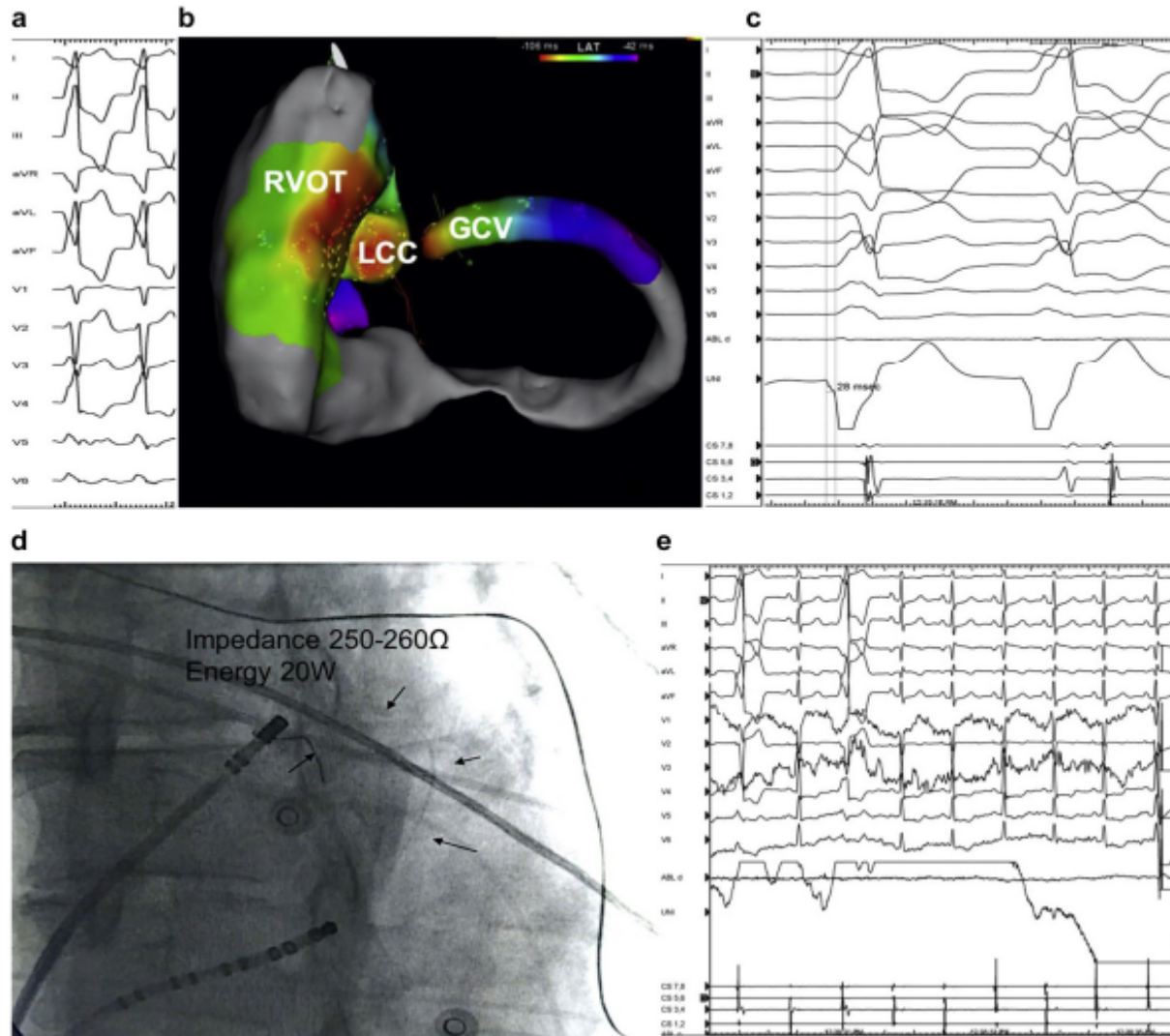


- AIV için ablasyon için koronerlere güvenli mesafe en az 5 mm
- 15-20 W
- Empedans!!! (Bazal empedansı düşürmek için patch sayısı ve dağılımı artırılabilir)
- Half normal saline
- Steam pop riski!!!

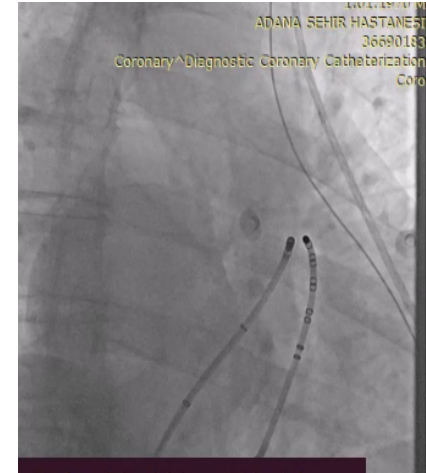
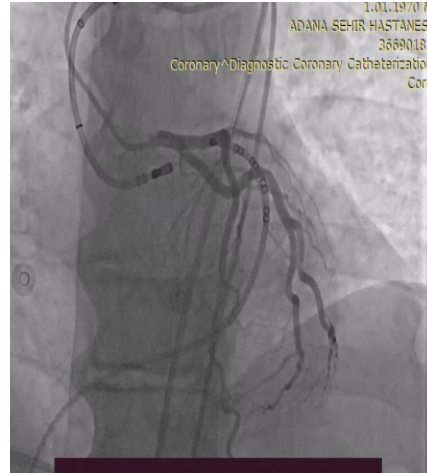
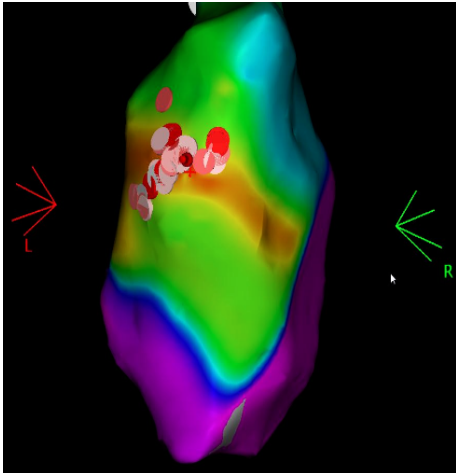
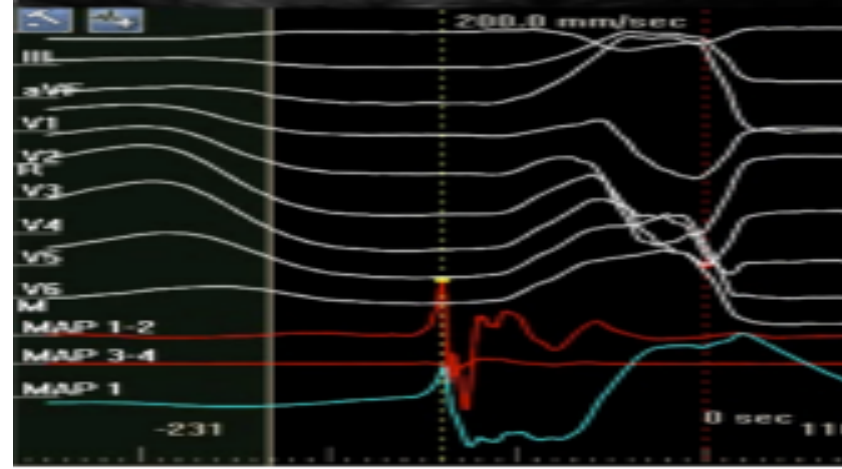


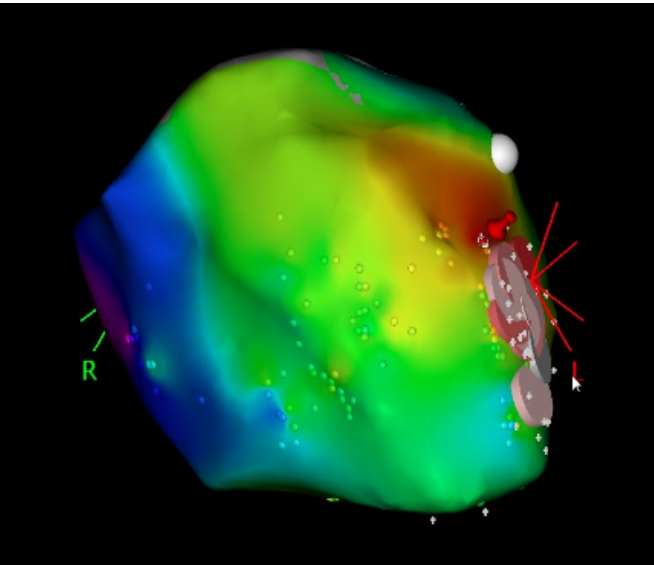




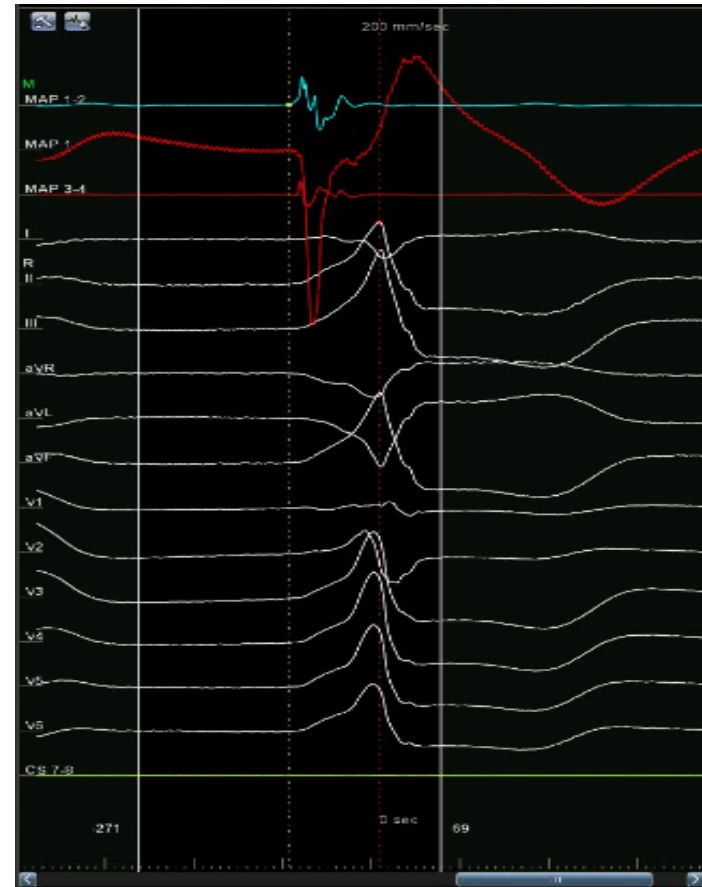


- AIV ablasyon riskli olduđu veya eriřilemediđi durumlarda en yakın komřuluđu pulmoner kapak üstünden
- LAD !!!
- V2 pattern break

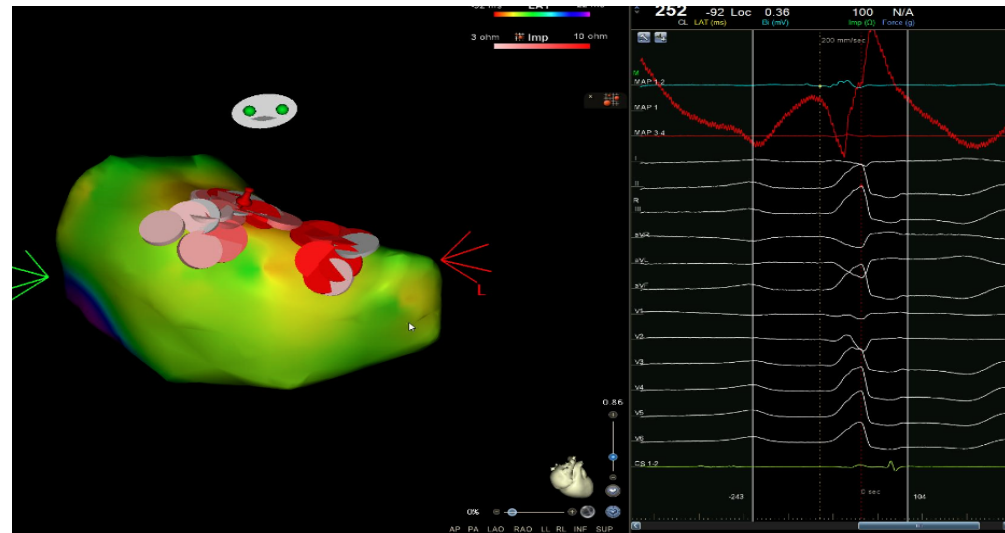
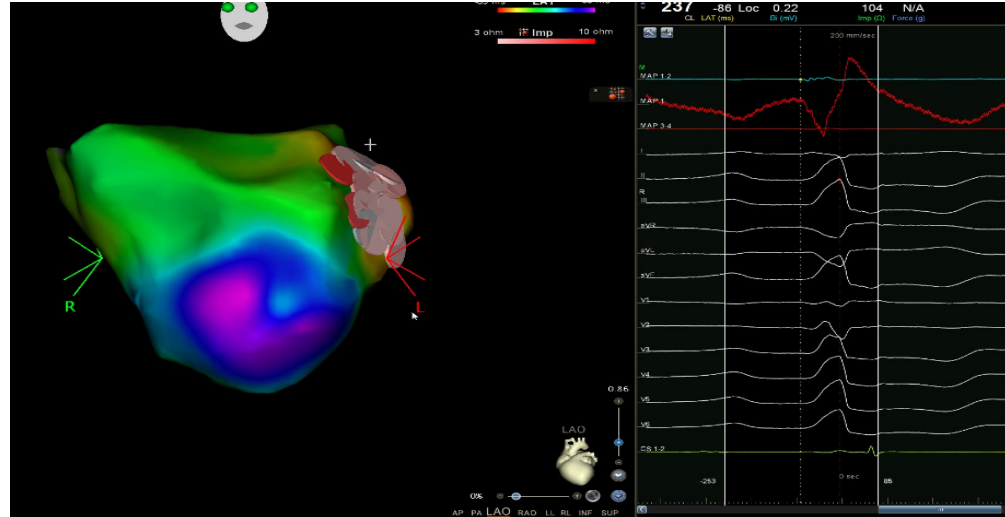


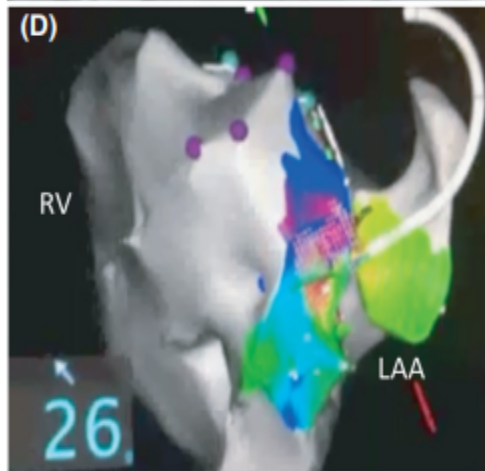
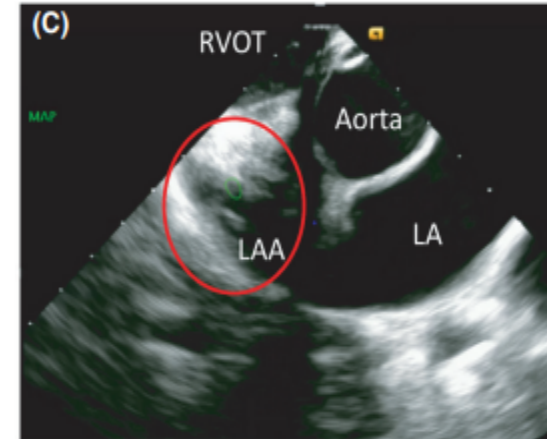
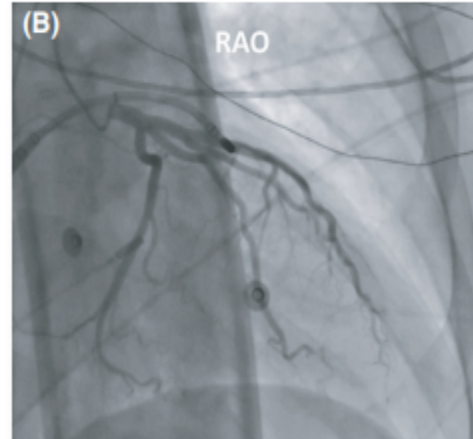
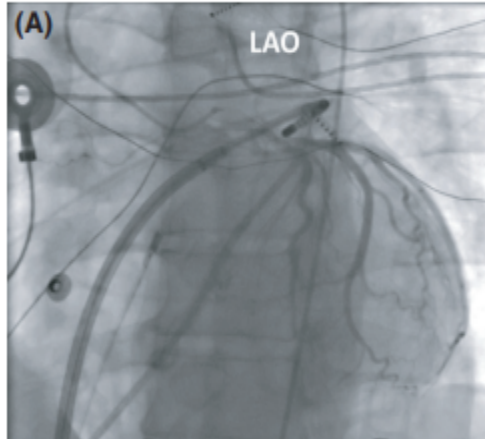


- LCC
- RCC
- RCC-LCC bileşke

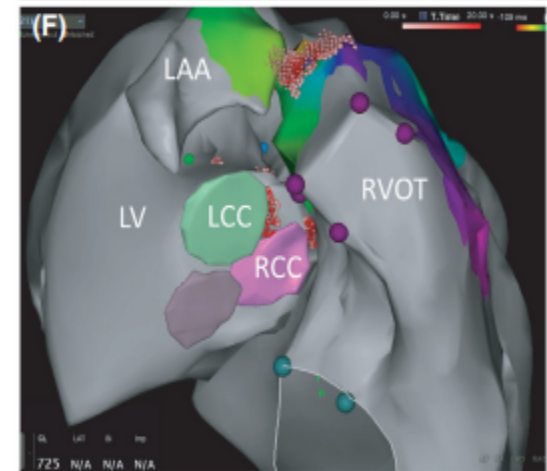
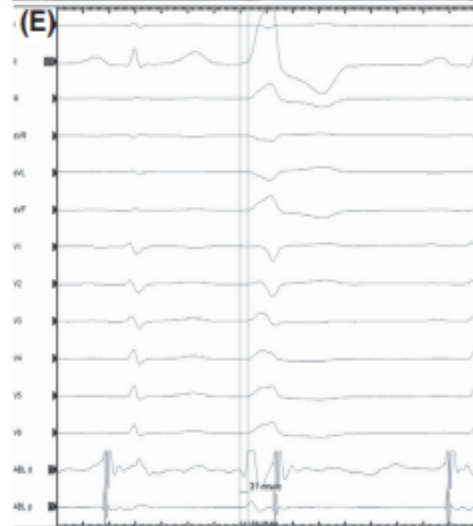


- LCC kapak altı





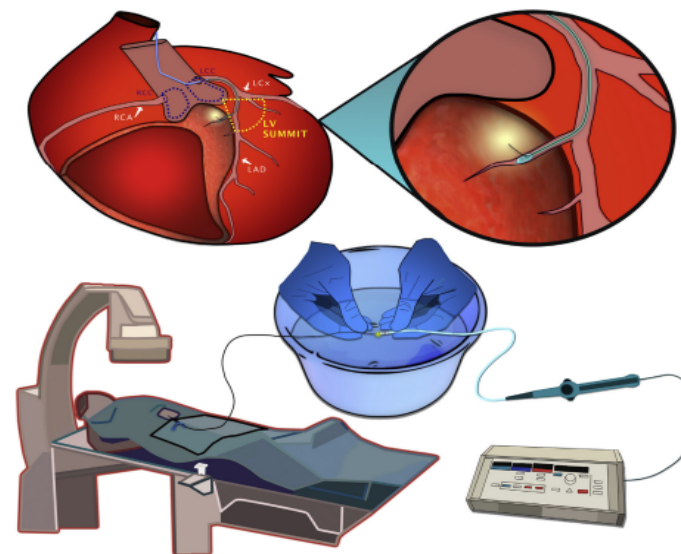
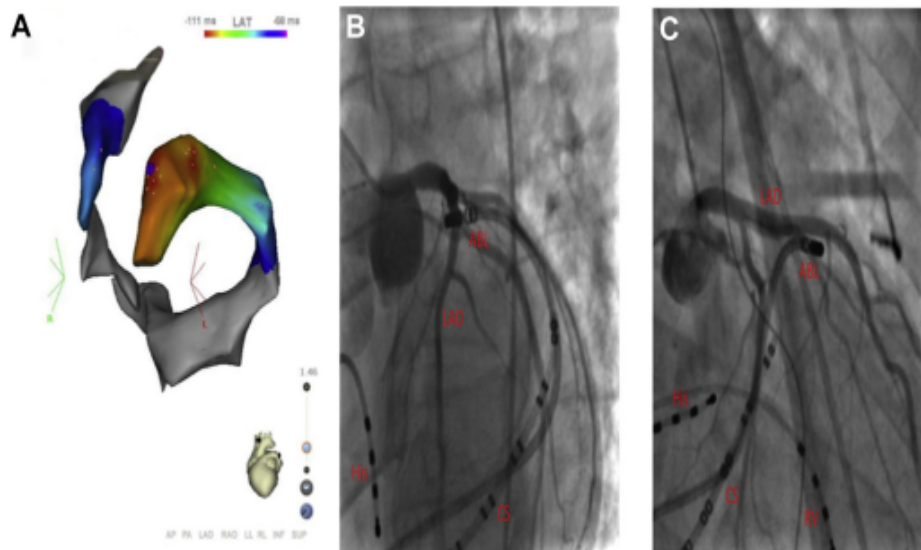
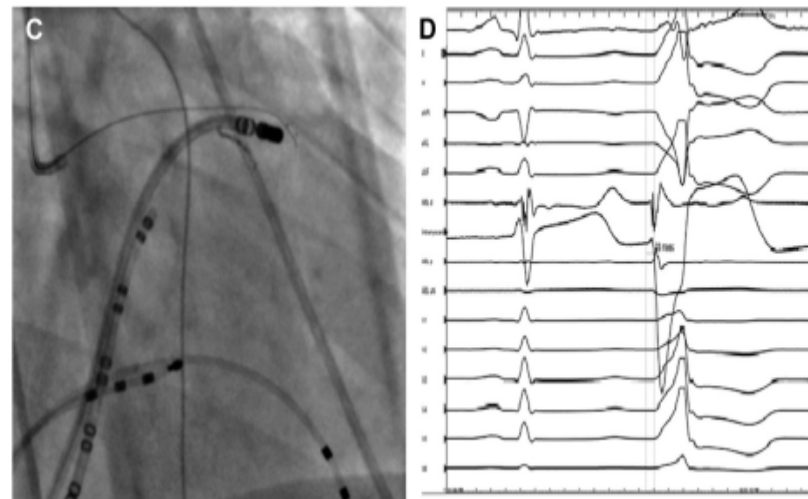
Left atrial appendage (LAA) activation

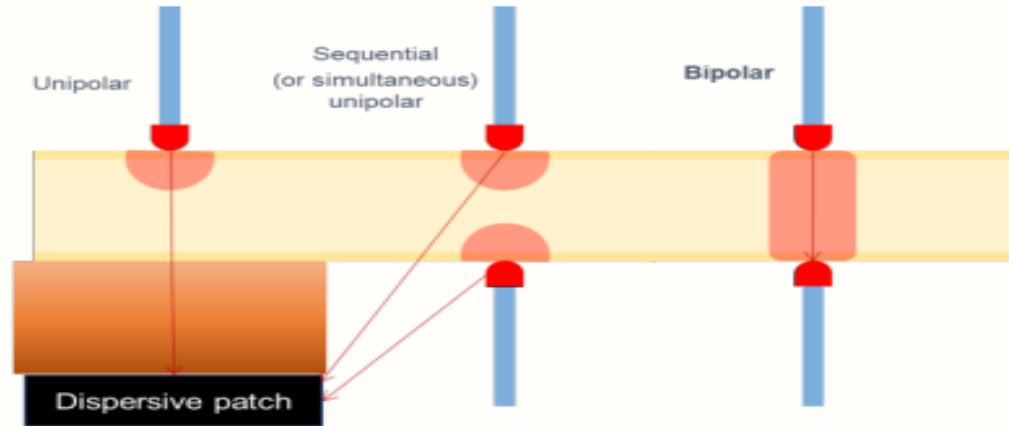


RVOT – LV summit – LAA relation

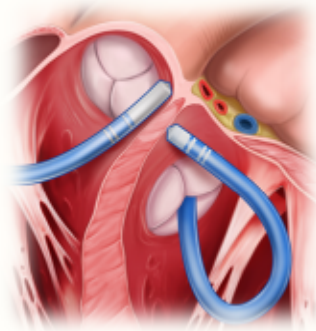
Intramyocardial radiofrequency ablation of ventricular arrhythmias using intracoronary wire mapping and a coronary reentry system: Description of a novel technique

Jorge Romero, MD, FHRS,*[†] Juan Carlos Diaz, MD,[†] Justin Hayase, MD,* Ravi H. Dave, MD,* Jason S. Bradfield, MD, FHRS,* Kalyanam Shivkumar, MD, PhD, FHRS*





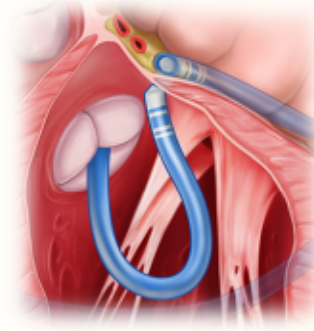
Antero-medial LV summit



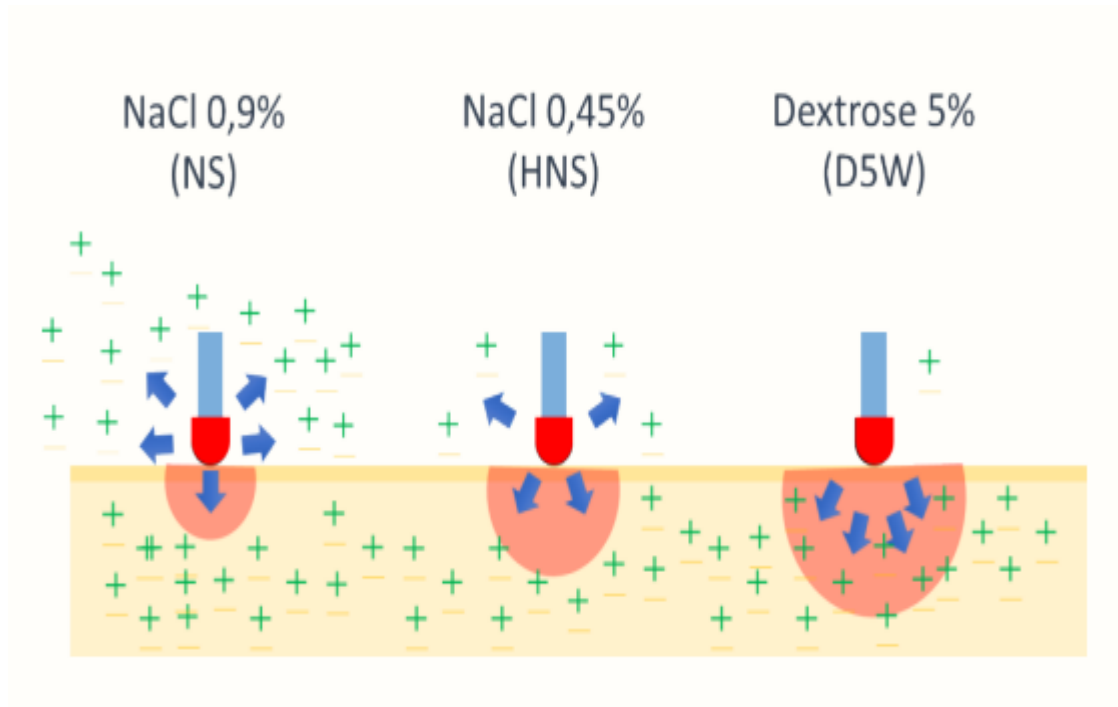
Inaccessible LV summit



Lateral LV summit



Sweet bipolar ablation



➤ *Circ Arrhythm Electrophysiol.* 2022 Aug;15(8):e011017. doi: 10.1161/CIRCEP.122.011017.
Epub 2022 Aug 2.

Advanced Techniques for Ethanol Ablation of Left Ventricular Summit Region Arrhythmias

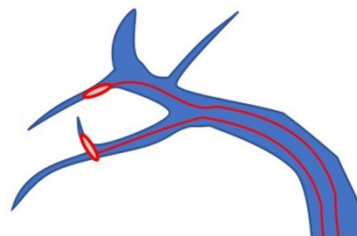
Apoor Patel ¹, Michelle Nsahlai ¹, Thomas Flautt ¹, Akanibo Da-Warikobo ¹, Adi Lador ¹,
Carlos Tapias ¹, Diego Rodríguez ², Luis Carlos Sáenz ², Paul A Schurmann ¹, Amish Dave ¹,
Miguel Valderrábano ¹

ADVANCED TECHNIQUES FOR LV SUMMIT ETHANOL ABLATION

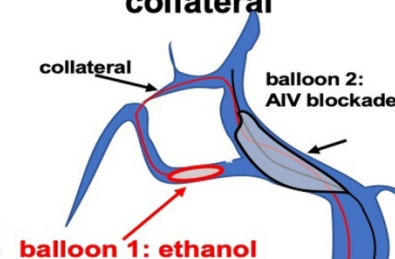
Double balloon for distal protection



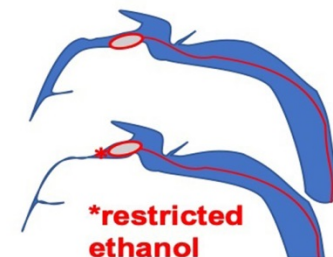
Multi-vein ethanol



Antegrade ethanol via collateral



Ethanol vein sclerosis





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JACC: Clinical Electrophysiology

Volume 8, Issue 4, April 2022, Pages 465-476



Focus on Ventricular Tachycardia

New Research Papers: Ventricular Arrhythmias - Catheter Ablation

Utility of Prolonged Duration Endocardial Ablation for Ventricular Arrhythmias Originating From the Left Ventricular Summit

Lohit Garg MD, Thomas Daubert MD, Aung Lin MD, Bishnu Dhakal MD, Pasquale Santangeli MD, PhD
, Robert Schaller DO, Matthew C. Hyman MD, Ramanan Kumareswaran MD, Jeffrey Arkles MA, MD
, Saman Nazarian MD, PhD, David Lin MD, Michael P. Riley MD, PhD, Gregory E. Supple MD
, David S. Frankel MD, Erica Zado PAC, David J. Callans MD, Francis E. Marchlinski MD
, Sanjay Dixit MD  

- **External ışın ablasyonu???**
- **Elektroporasyon (Pulse field ablasyon)???**
- **Manyetik olarak yönlendirilmiş metalik nanopartiküller???**



TEŞEKKÜRLER