

Sol Atrial Taşikardi Ablasyonu

**Dr.Basri Amasyalı
TOBB ETÜ Üniversitesi
Tıp Fakültesi**

Atrial Taşikardiler

- ▶ SVT'lerin %5-15' ine karşılık gelir
- ▶ Paroksismal ya da Persistan
- ▶ Mekanizma
 - ▶ Fokal: otomatisite, triggerred aktivite ya da mikroreentri
 - ▶ Makroreentran

Fokal vs Makroreentran

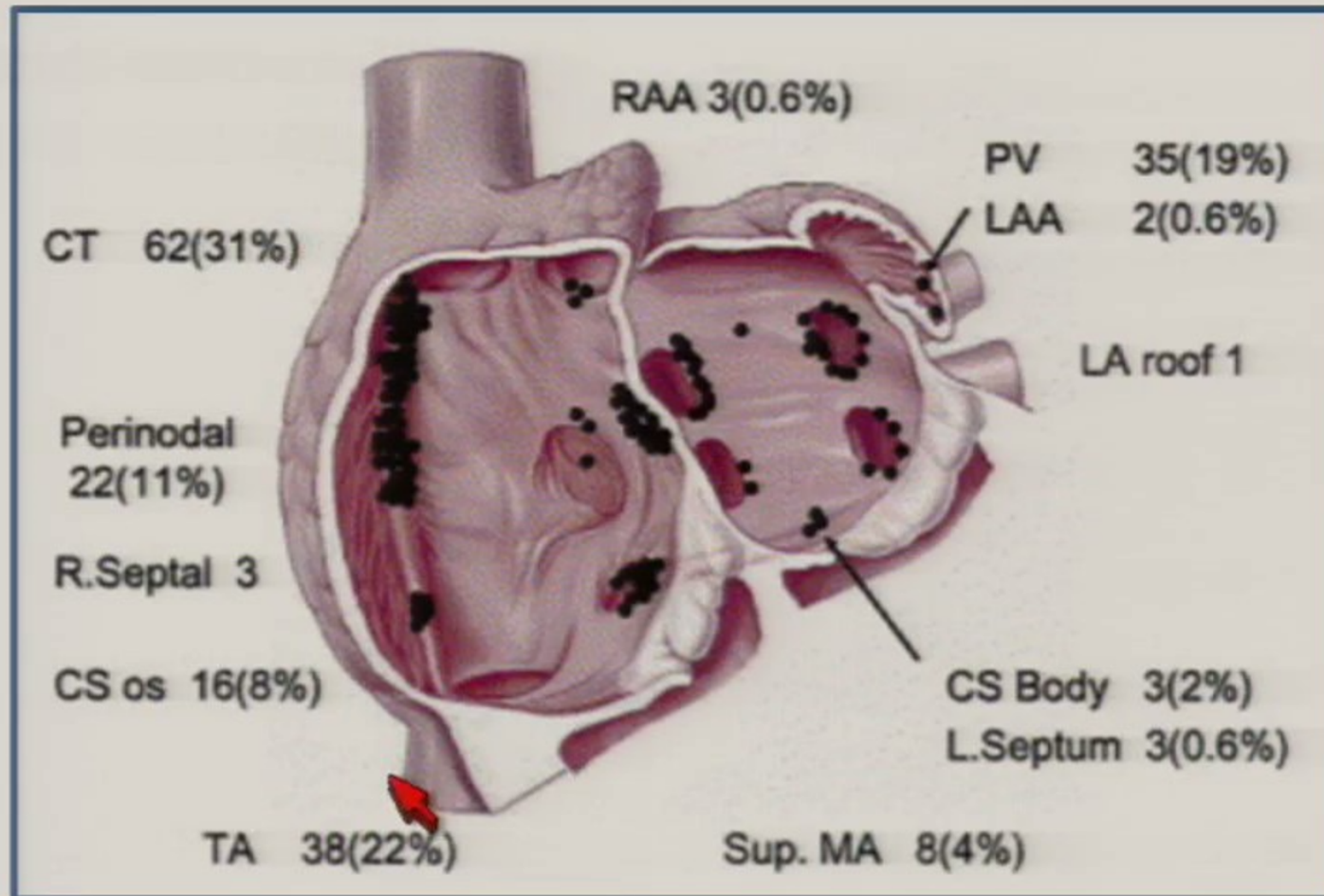
	Fokal	Makroreentran
EKG	Diskrete P dalgası, sıklıkla !	Flutter dalgaları
Atrial aktivasyon	Merkezden etrafa ışınsal aktivasyon	Belli bir anatomik bölgede ardışık sürekli aktivasyon
Entrainment	İyi PPI taşikardinin çıkıldığı yerdedir ve tek bir anatomik nokta	İyi PPI taşikardi halkasının geçtiği yerlerdedir ve farklı anatomik bölgelerde (> 2 cm) iyi değerler alınır
Adenozin	Otomatisite: geçici baskılar/- Trigerred: durdurur Mikroreentri: -	Etkisiz
PES ile indüksiyon/terminasyon	Otomatisite: - Trigerred: başlatır/ durdurur Mikroreentri: başlatır/ durdurur	başlatır/ durdurur
Ablasyonda	Lokal en erken nokta	Kritik isthmus, fraksiyone, düşük amplitüdü kayıtlar

Focal Atrial Tachycardia

Anatomic Distribution

Right Atrium:
73% (144)

Left Atrium:
27% (52)



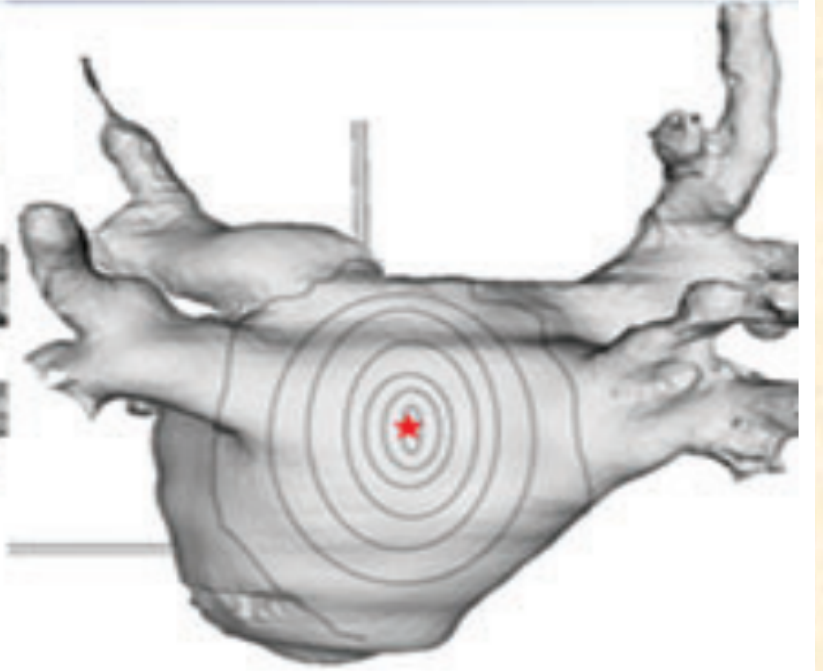
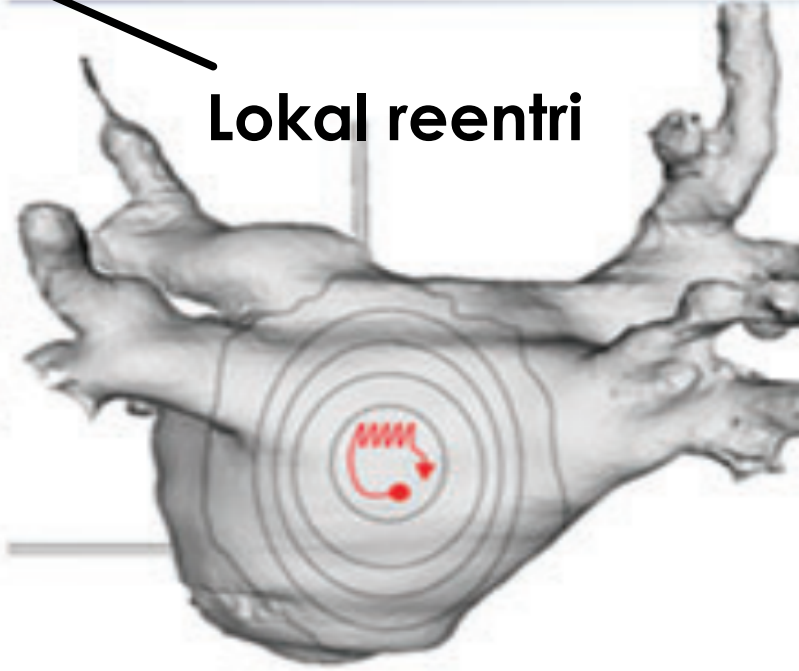
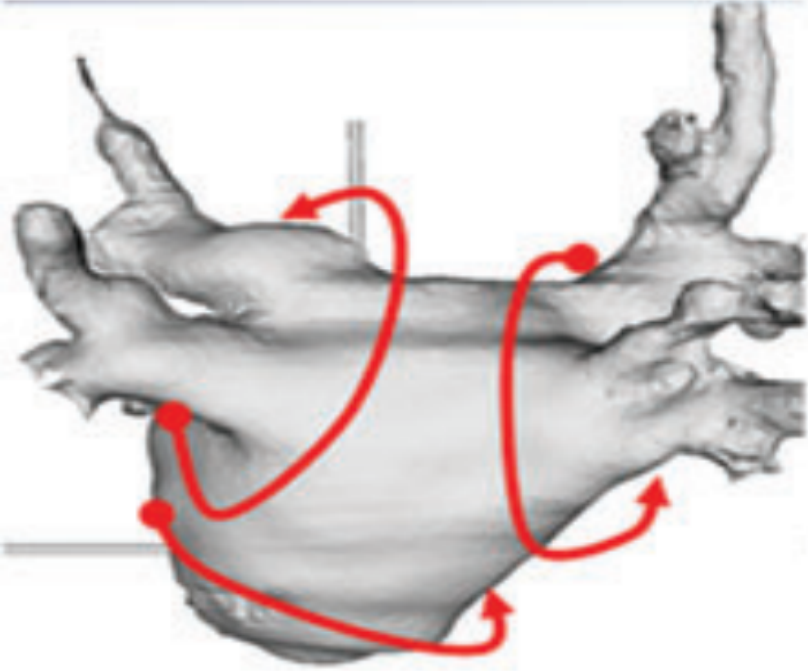
Macroreentry

Centrifugal

a

b

c



Lokal reentri

- Belli bir anatomik bölge reentrisi
- TCL'nin >%75 haritalanabilir
- >2 farklı **anatomik bölgede** PPI iyi

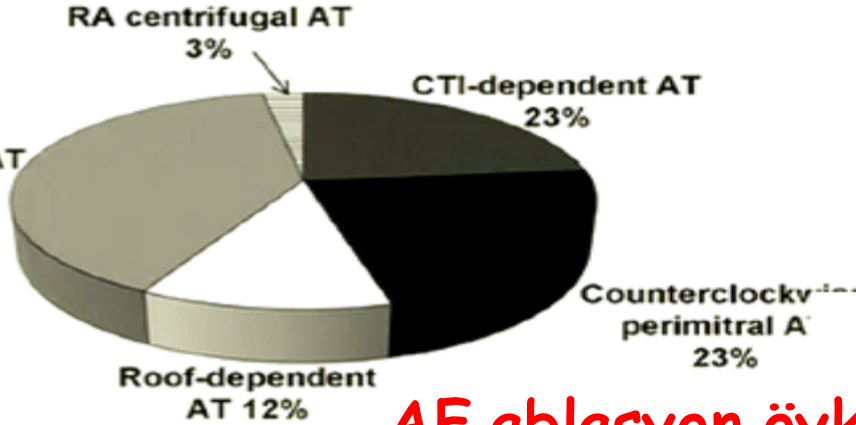
- Işınsal aktivasyon
- TCL'nin >%75 haritalanabilir
- PPI sadece **merkez bölgede** iyi

- Işınsal aktivasyon
- TCL'nin < **%75** haritalanabilir
- PPI sadece **odakta** iyi



Proximal to distal CS activation

LA centrifugal AT
40%

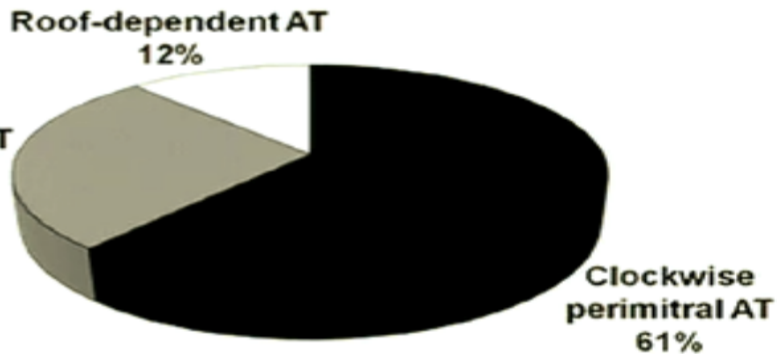


**AF ablasyon öyküsü olan hastalar:
CS aktivasyonu ?**



Distal to proximal CS activation

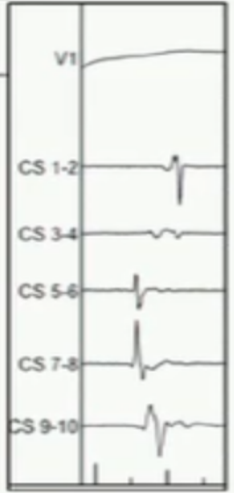
LA centrifugal AT
27%



« C » CS activation

Genellikle LA posterior duvar

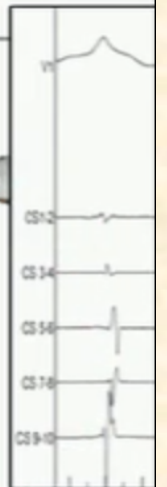
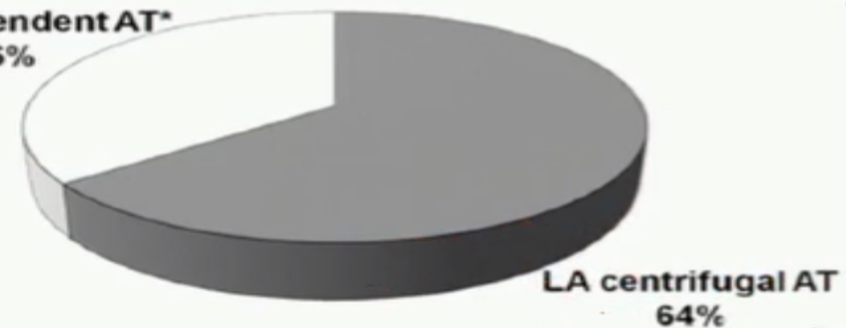
Roof-dependent AT
17%

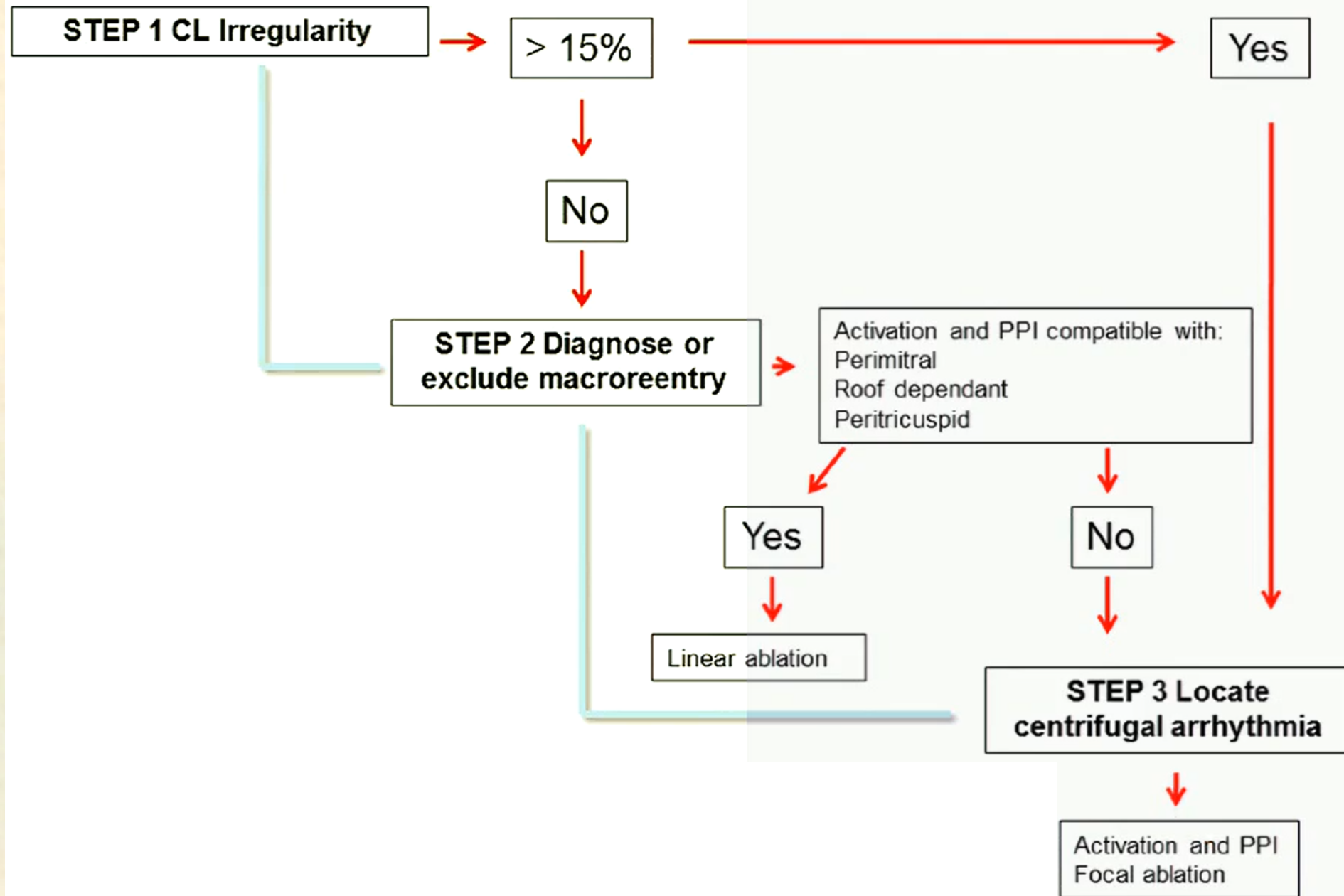


« D » CS activation

Genellikle LA anterior duvar

Roof-dependent AT*
36%



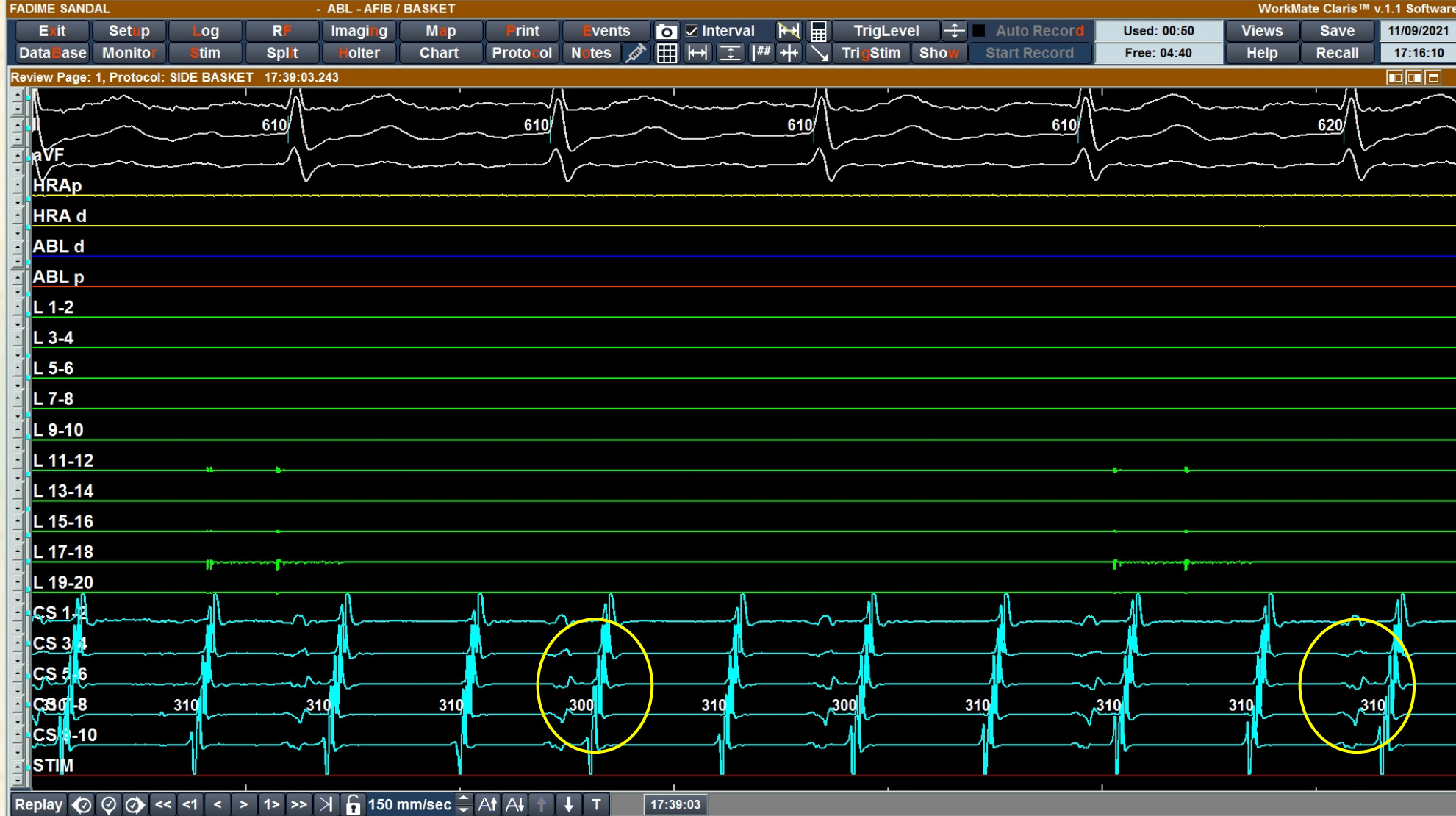


Entrainment kořulları

- ▶ Stabil tařikardi
- ▶ Capture yaptıđınızdan emin olun
 - ▶ Tüm elektrogramlarda TCL'nin kısaldıđını teyit edin
- ▶ TCL hızından 10-20 msn kısa hızda pace et. Daha hızlıdan kaçın
 - ▶ Durdurabilirsin
 - ▶ Aktivasyonu deđiřtirebilirsin
 - ▶ Dekremental ileti nedeniyle yanlıřlıkla uzun PPI deđerleri alabilirsin
- ▶ Antidromik ve ortodromik capture durumuna göre tanınızı ve yerinizi belirleyin
- ▶ <20 msn olan yerler hedef bölge içinde

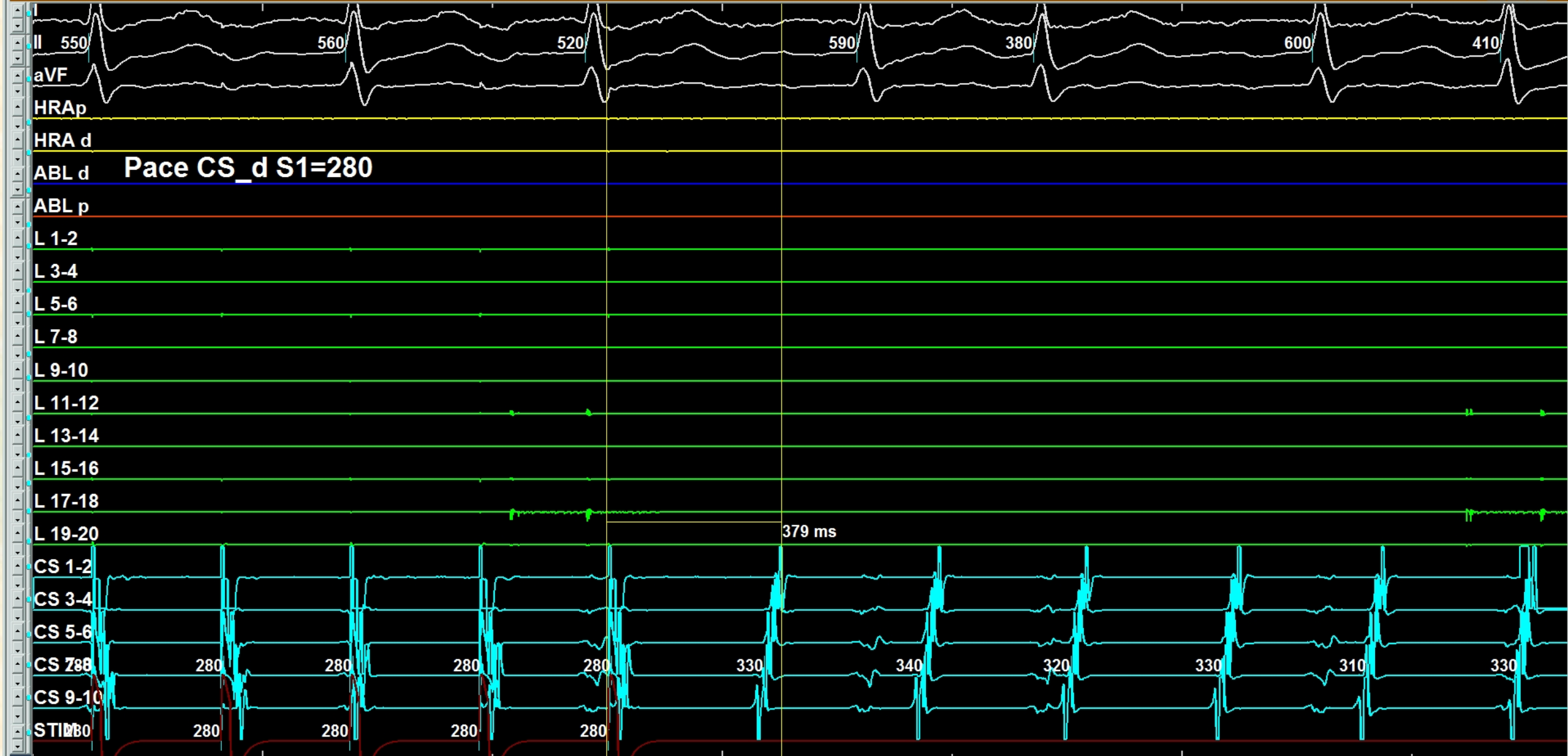
Olgu 1

2 aydır çarpıntı: 65 yaşında kadın hasta, FdSnd
MVR ve cerrahi AF ablasyonu
EF normal, LA dilate 60 mm.



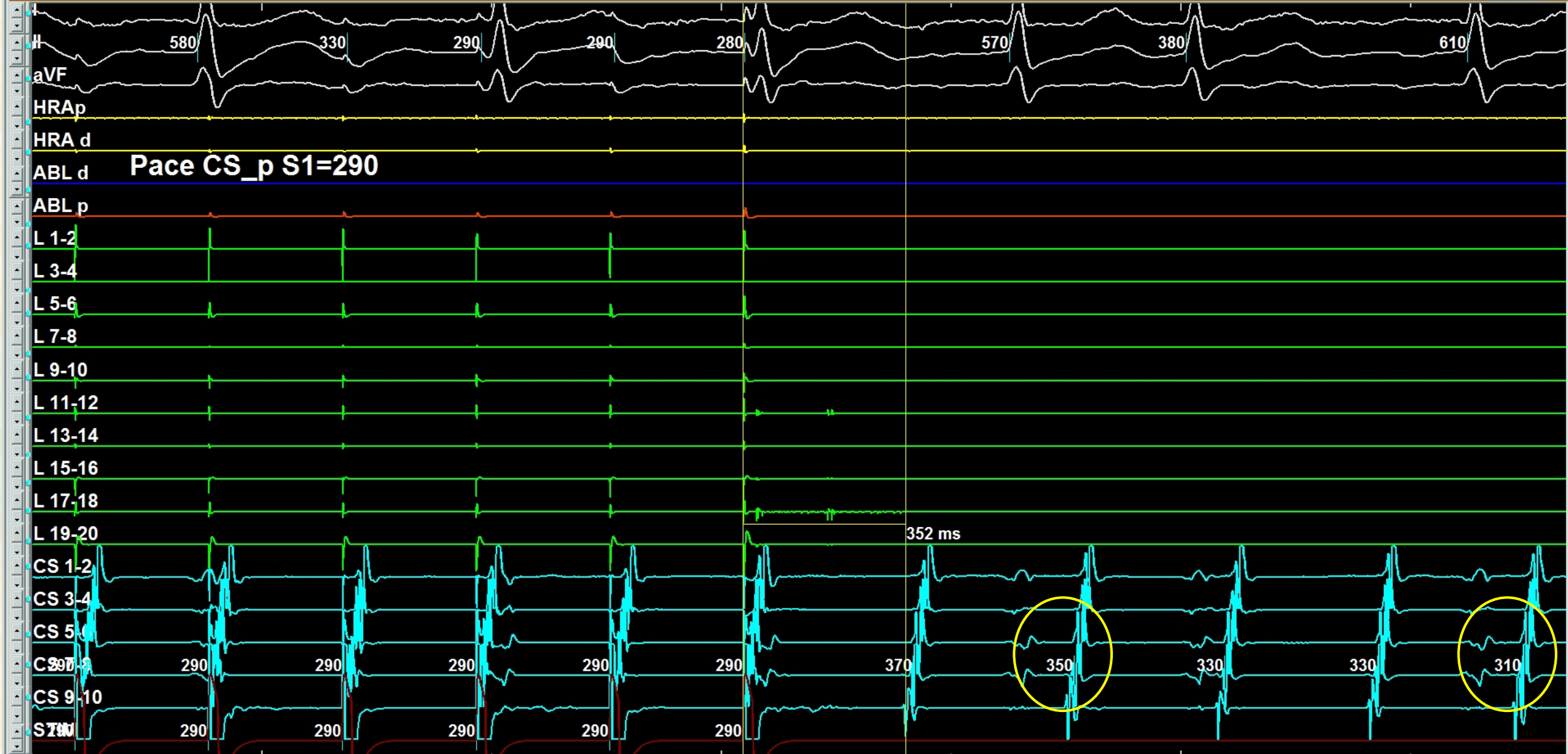
Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:50 Views Save 11/09/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 04:40 Help Recall 17:15:46

Review Page: 1, Protocol: SIDE BASKET 17:39:13.225



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:50 Views Save 11/09/2021
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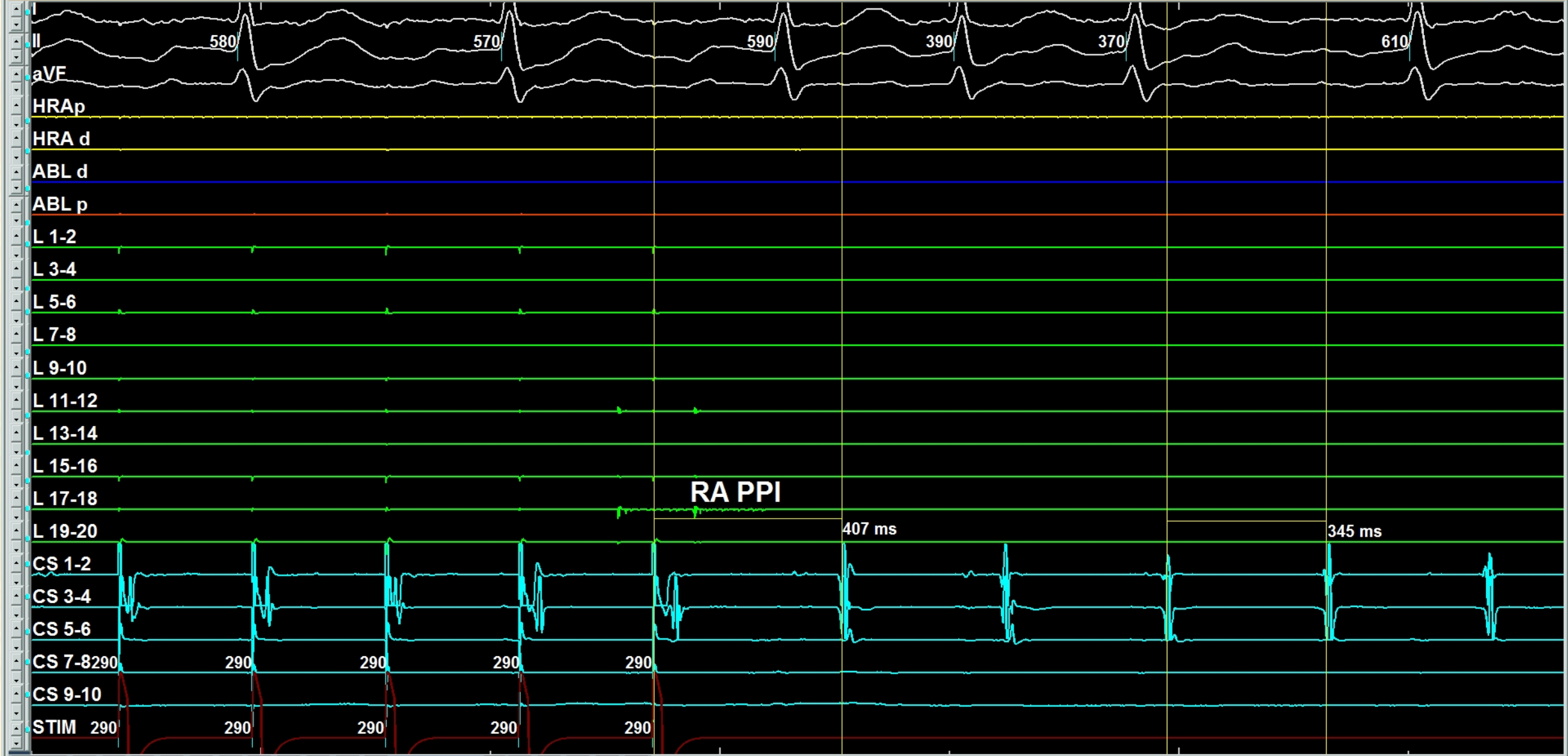
Review Page: 1, Protocol: SIDE BASKET 17:39:25.259



Replay 150 mm/sec 17:39:25

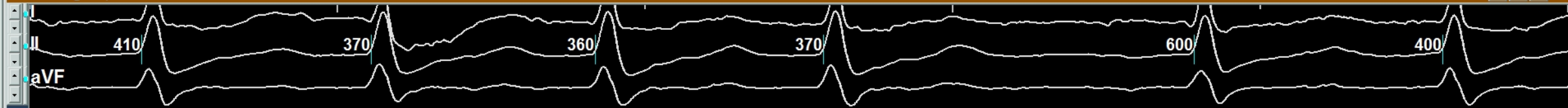
Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:50 Views Save 11/10/2021
DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 04:50 Help Recall 15:28:11

Review Page: 1, Protocol: SIDE BASKET 17:40:15.242



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DataBase	Monitor	Stim	Split	Holter	Chart	Protocol	Notes	TrigStim	Show	Start Record	Free: 04:40	Help	Recall	17:18:54

Review Page: 1, Protocol: SIDE BASKET 17:59:47.291



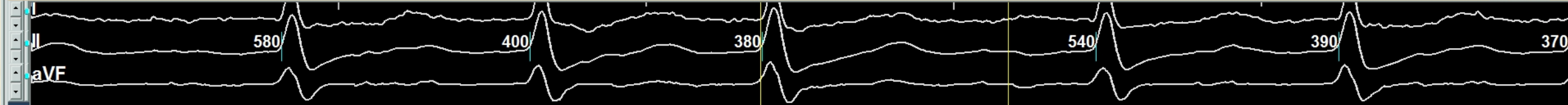
LAA bölgəsi



Replay [Navigation icons] 200 mm/sec [Navigation icons] 17:59:47

Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:59 Views Save 11/09/2021
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Review Page: 1, Protocol: SIDE BASKET 17:59:59.769

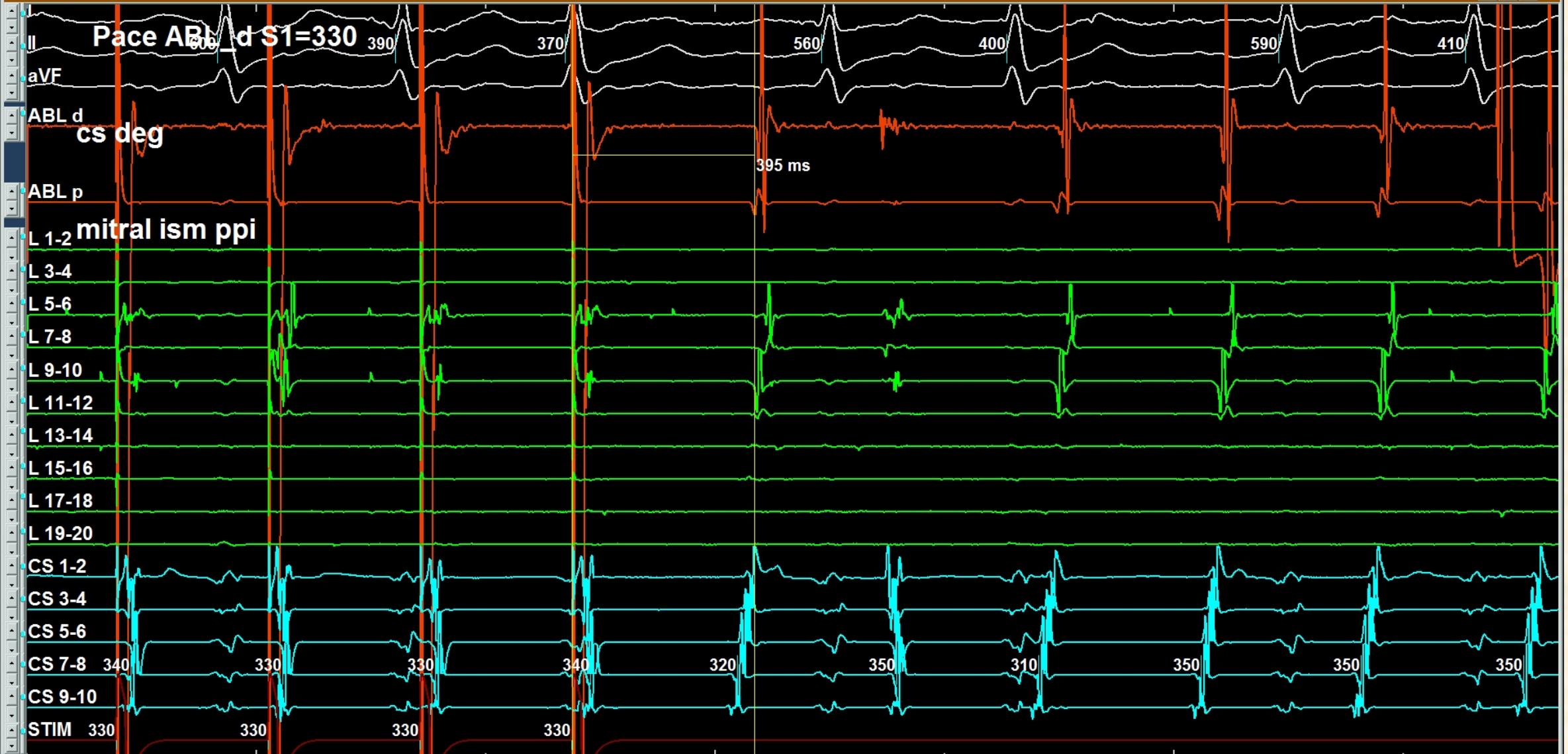


Pace L_13-14 S1=330



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:54 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 18:24:21

Review Page: 1, Protocol: SIDE BASKET 18:03:46.467



Replay ⏮ ⏪ ⏩ ⏭ 🔒 150 mm/sec ⏴ ⏵ ⏶ ⏷ ⏸

18:03:46

1-Map (957, 0) Resp

-82 ms LAT 94 ms
73 91

CL: 82+94=176ms
---%60---

61.00

1-Map (957, 0) Resp

0.20 mV Bi 0.50 mV

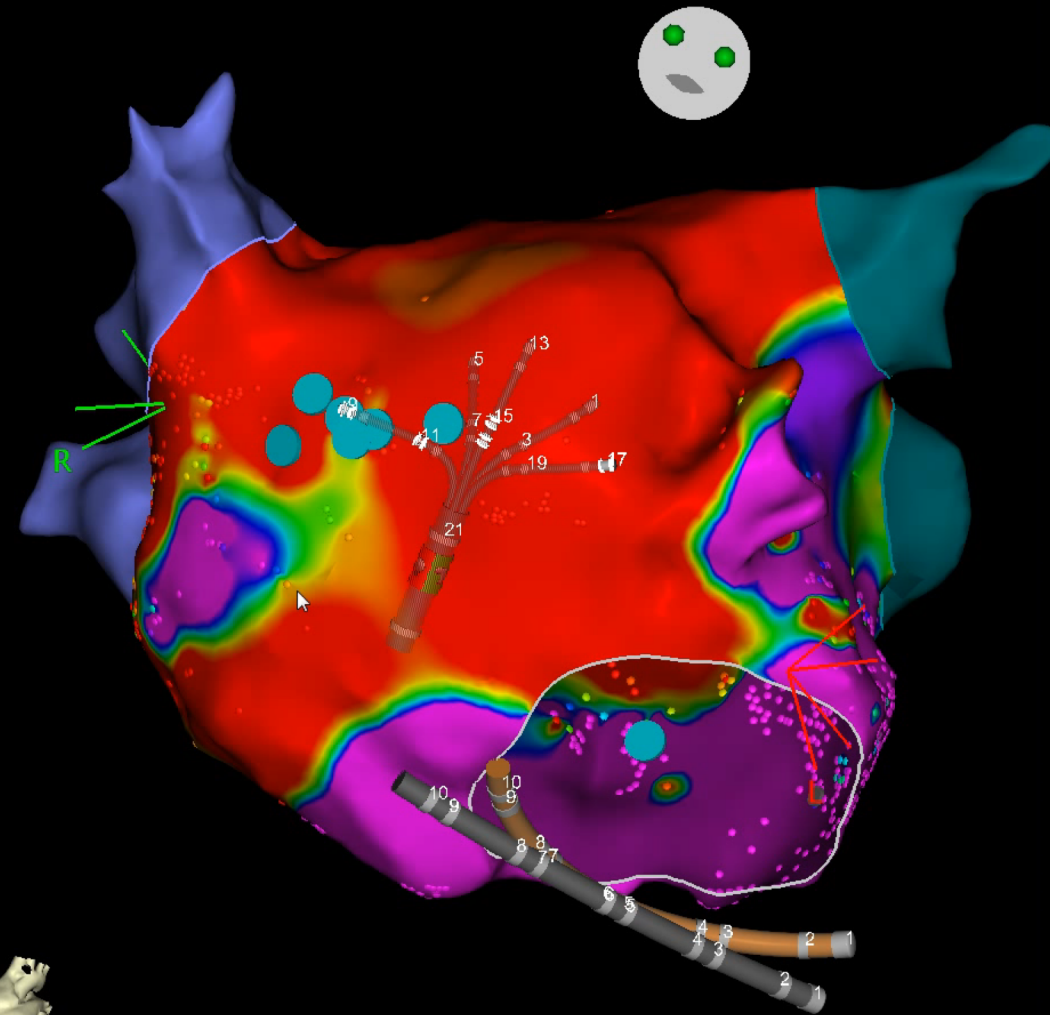
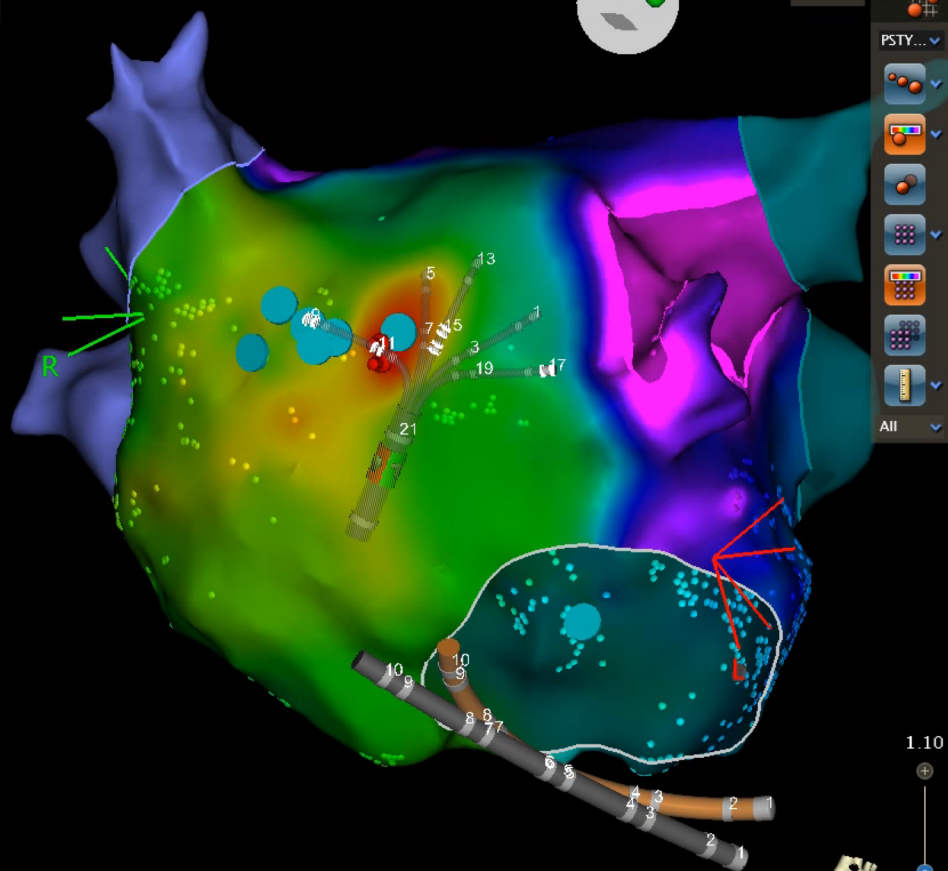
12

Settings icons: heart, lock, gear, slider, pills

PSTY...

- Icons for various data visualization options

All



LAT	CL	Bi	Imp	Force
N/A	N/A	N/A	N/A	N/A

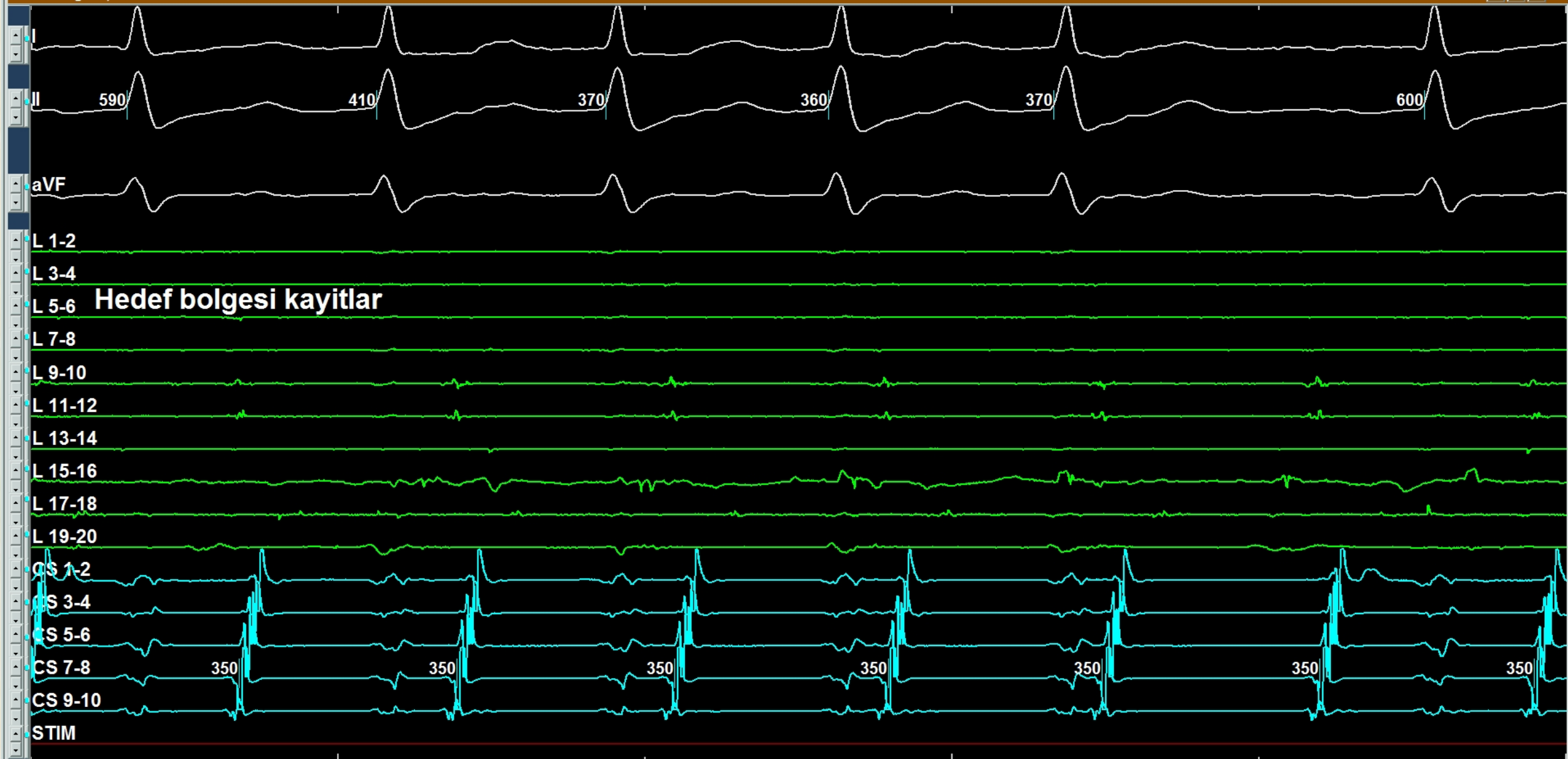
0% 0%

AP PA LAO RAO LL RL INF SUP

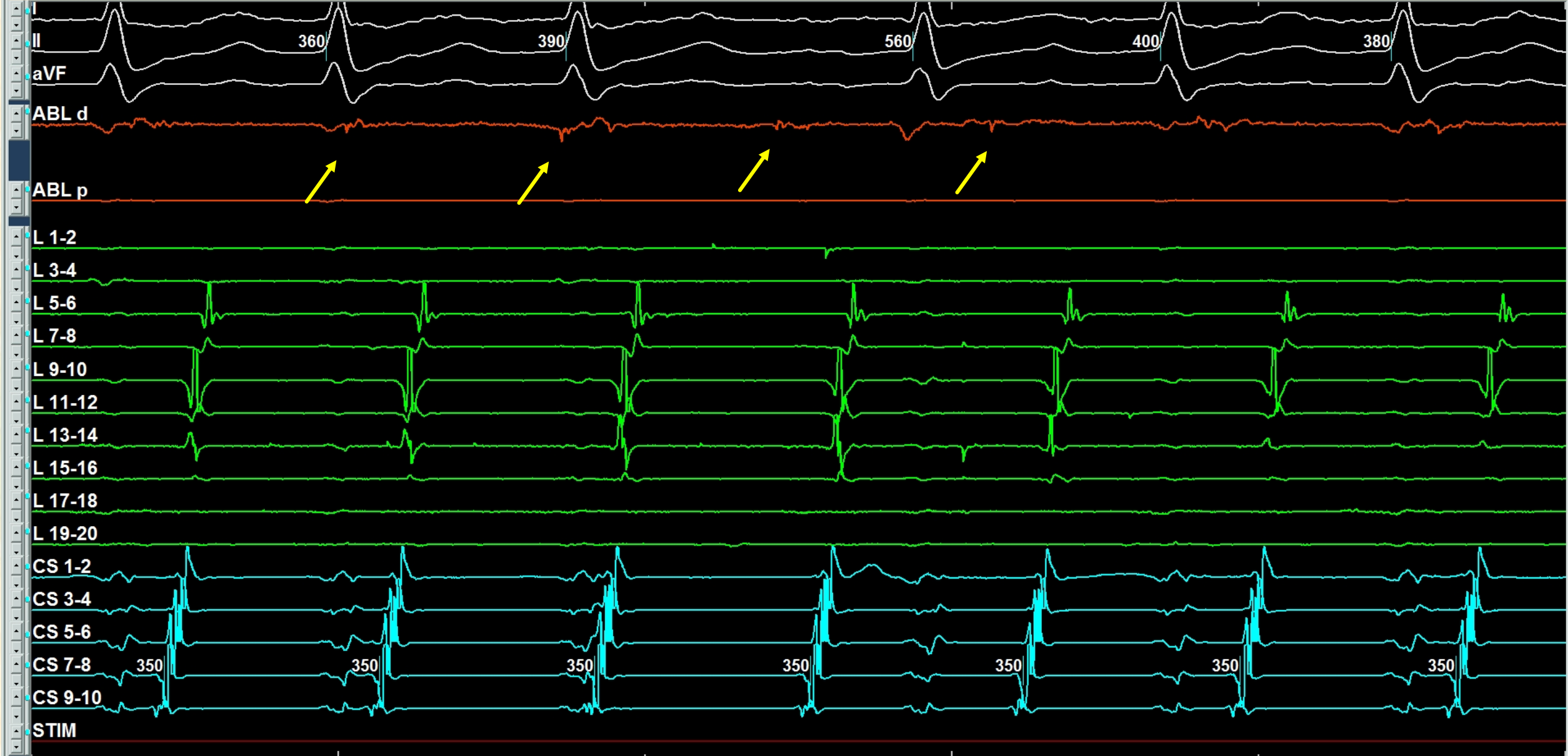
Sync

Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:59 Views Save 11/10/2021
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Review Page: 1, Protocol: SIDE BASKET 17:56:57.742



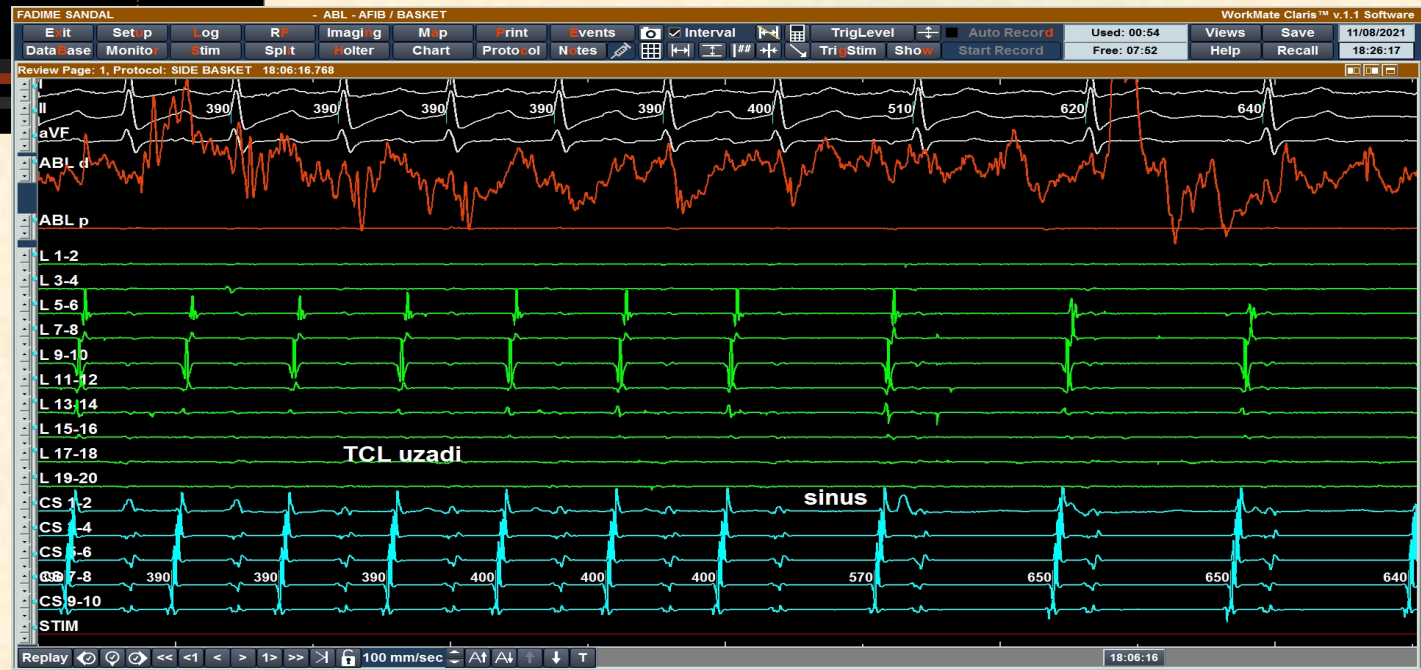
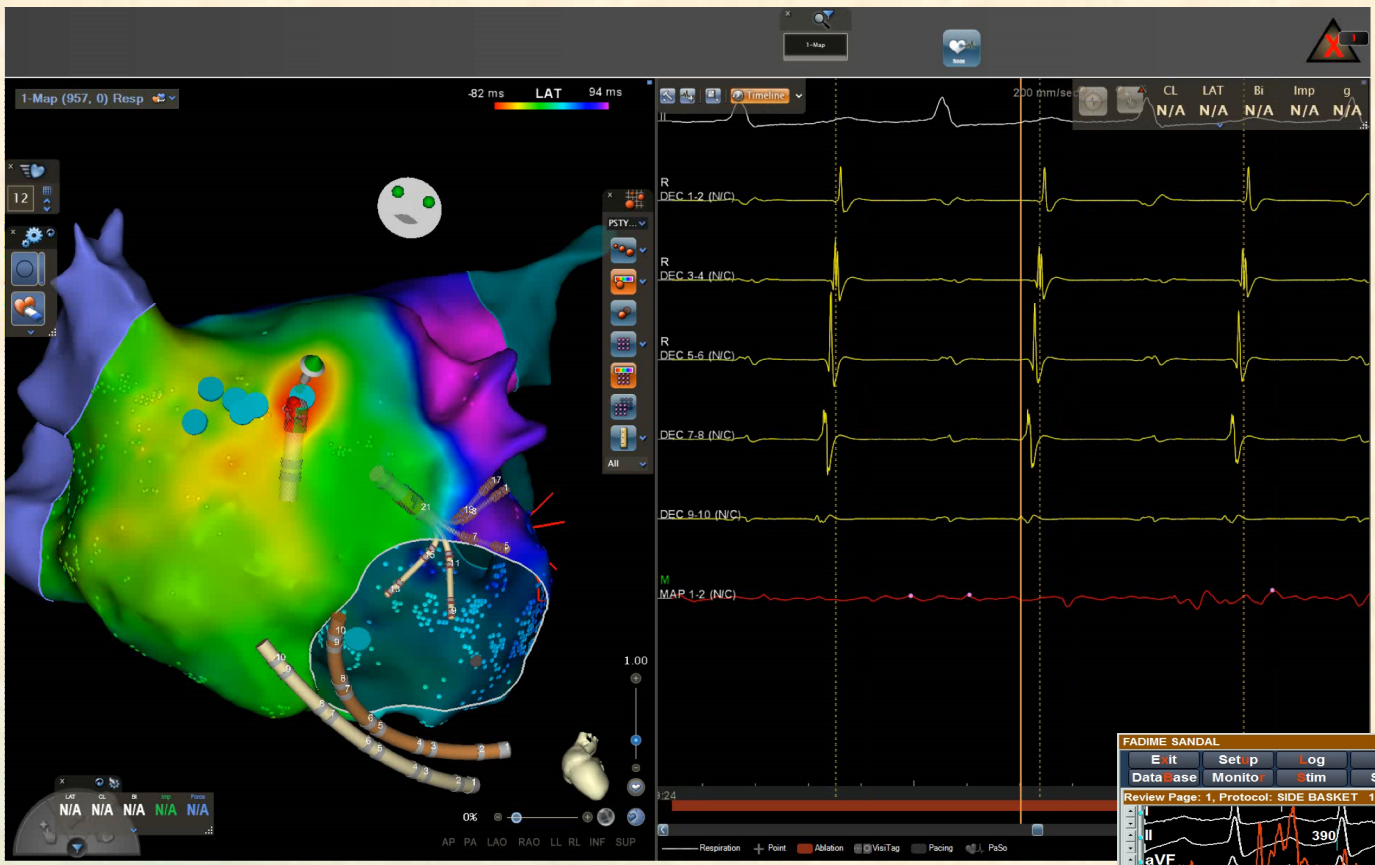
Review Page: 1, Protocol: SIDE BASKET 18:05:29.497



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:54 Views Save 11/10/2021
DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 04:50 Help Recall 15:23:40

Review Page: 1, Protocol: SIDE BASKET 18:05:29.497



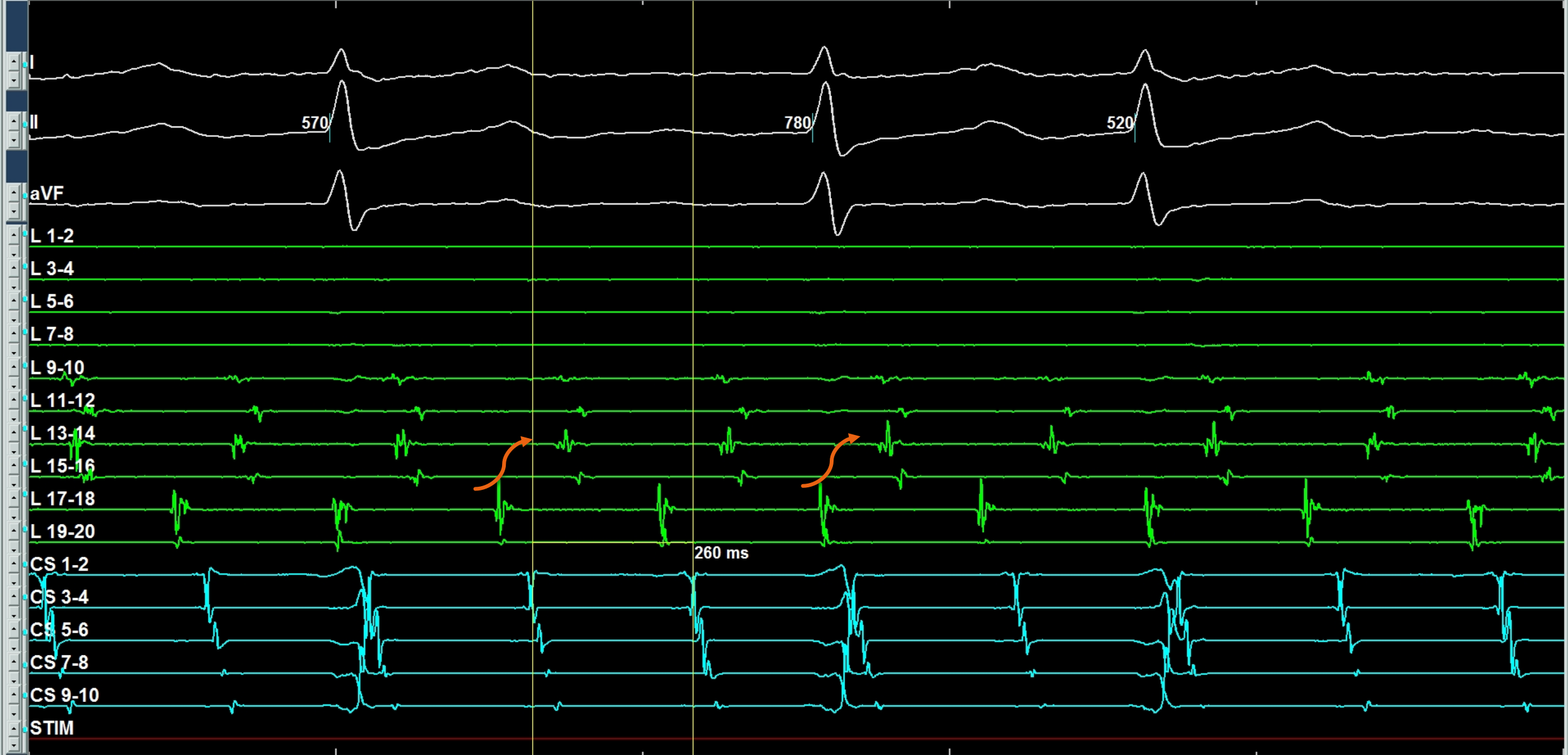


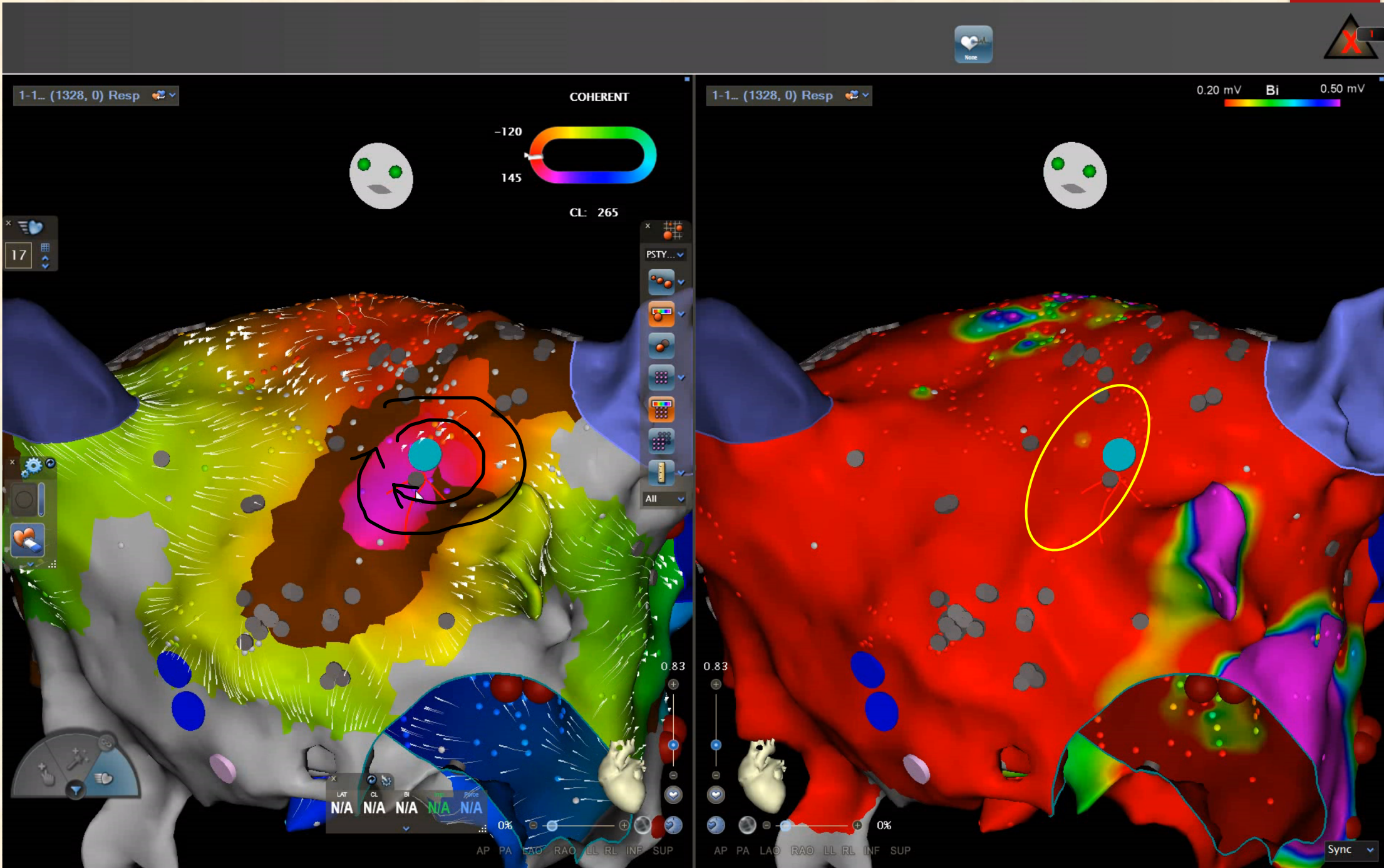
Olgu 2

MVR ve AVR, 65 yaşında kadın hasta,
2 defa AF ve atrial flutter için ablasyon öyküsü
3 aydır devam eden çarpıntı ve nefes darlığı var



Review Page: 1, Protocol: SIDE BASKET 19:04:13.445





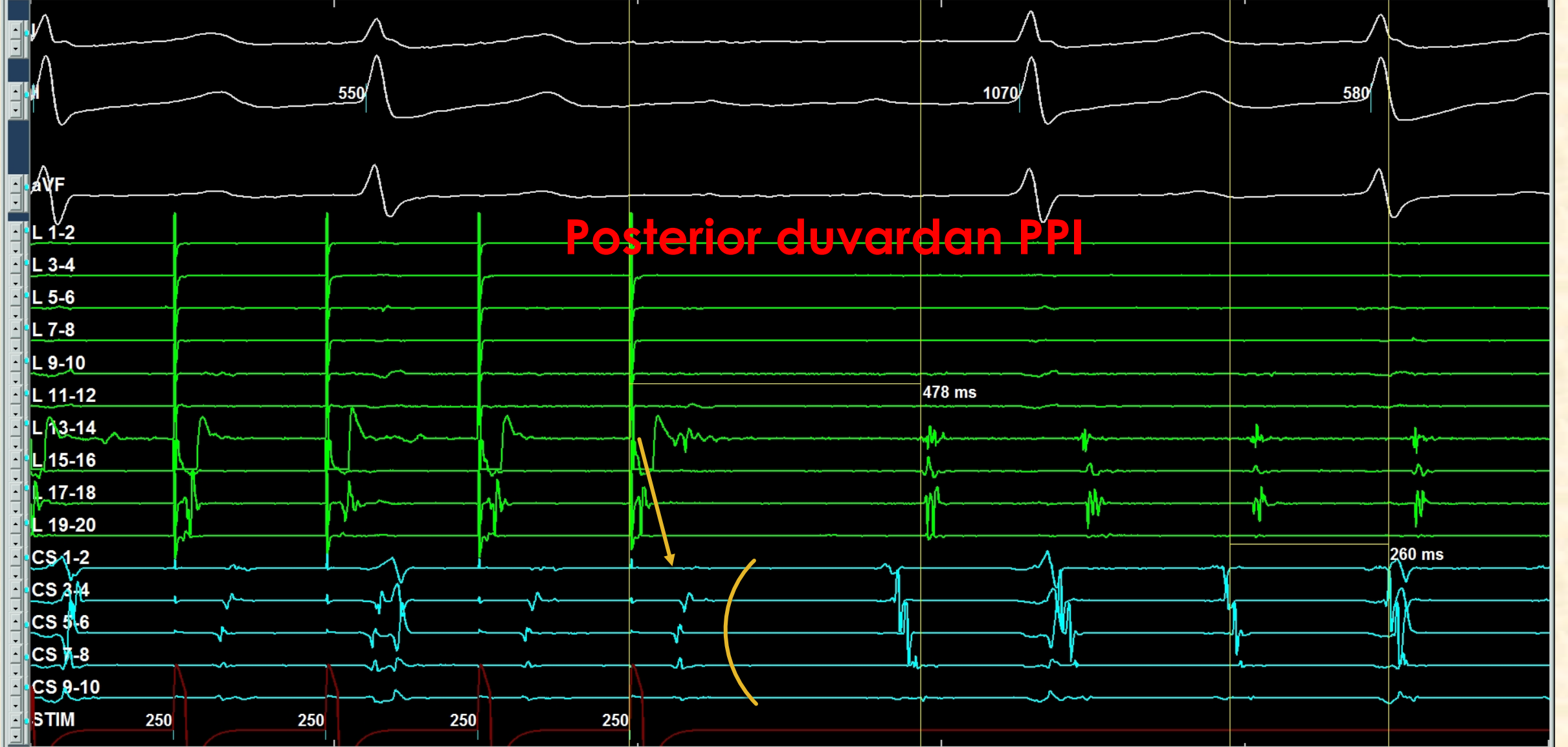
Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:29 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 18:30:57

Review Page: 1, Protocol: SIDE BASKET 19:06:42.061



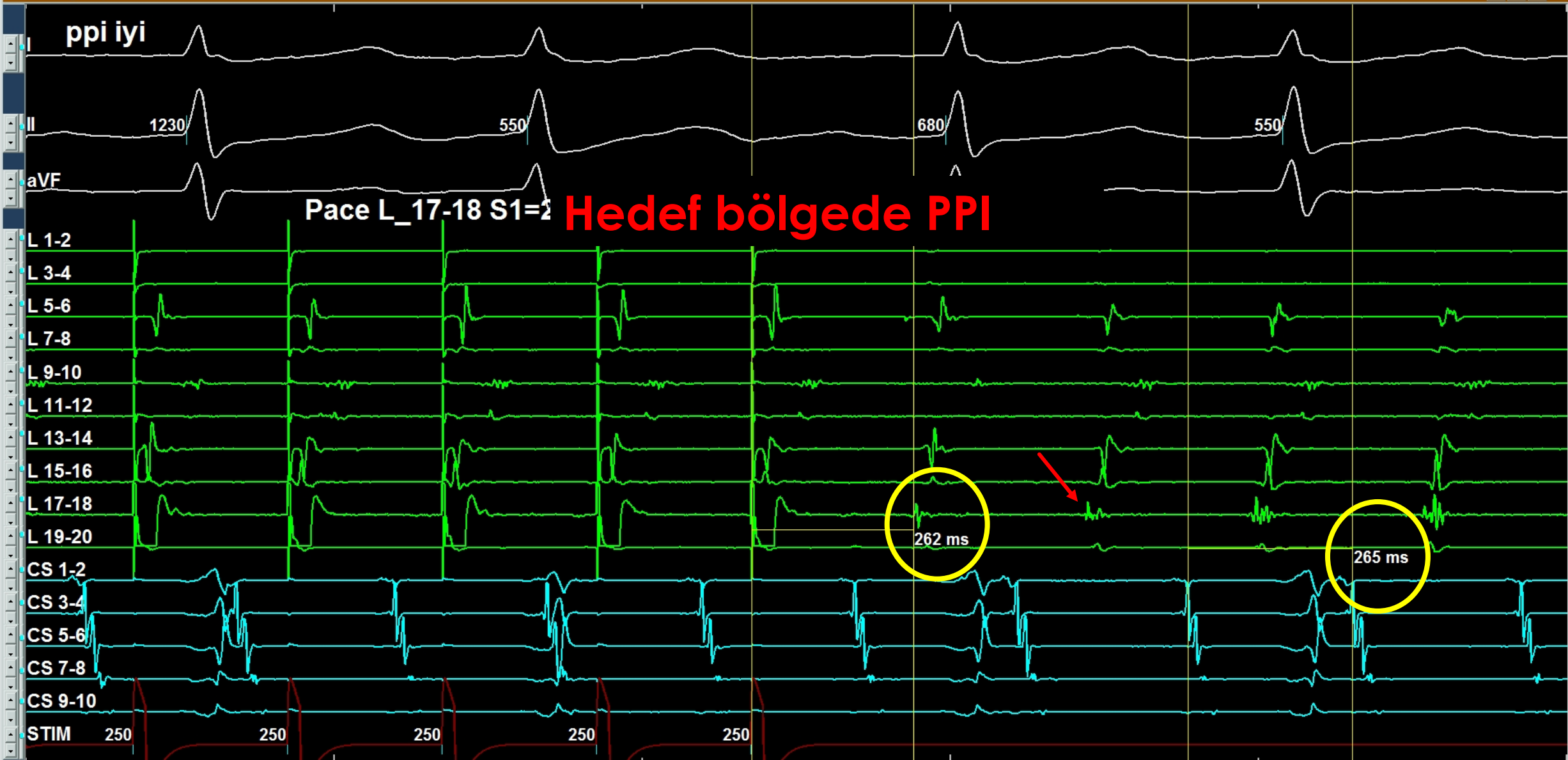
Replay 200 mm/sec

19:06:42



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:29 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 18:33:01

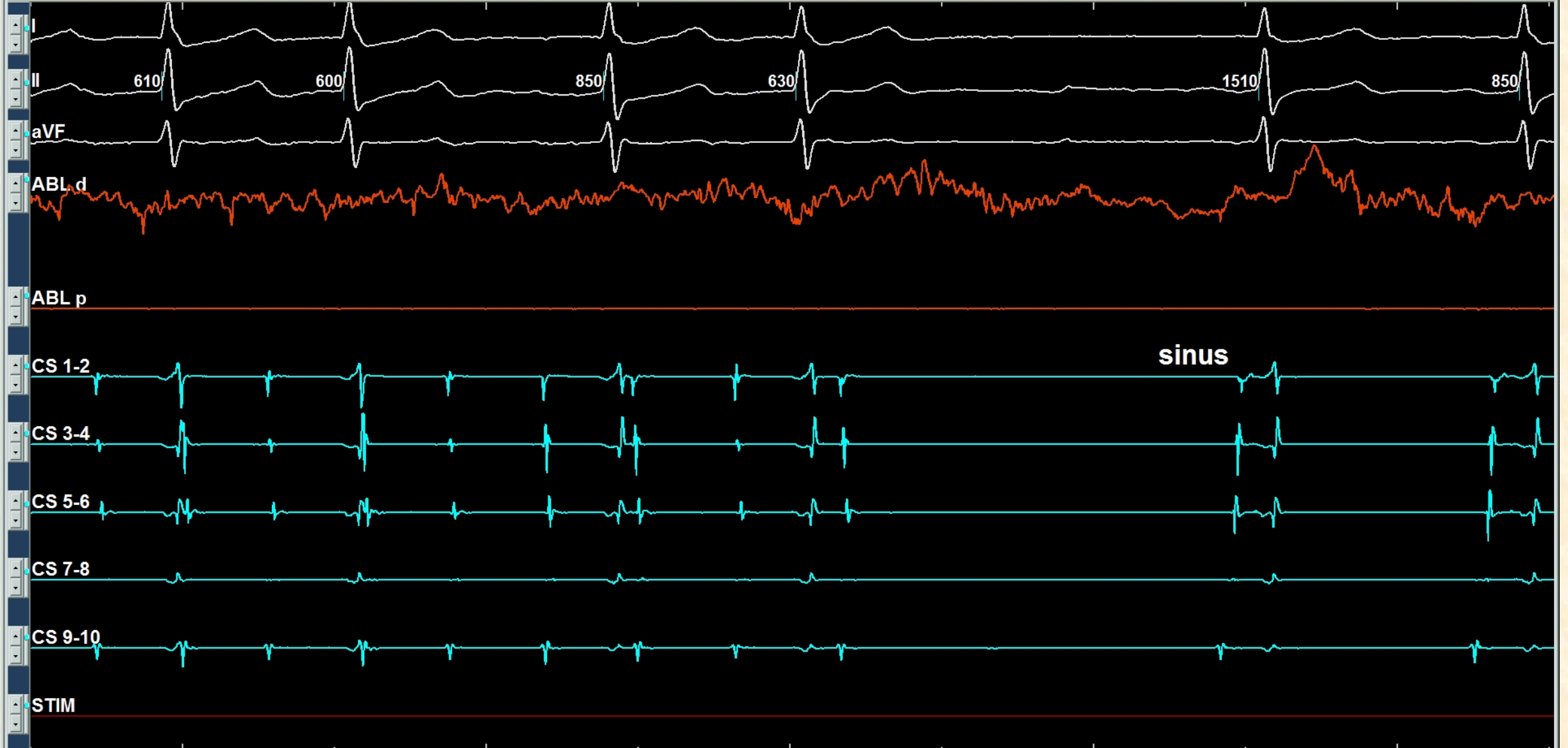
Review Page: 1, Protocol: SIDE BASKET 19:16:07.225





Exit	Setup	Log	RF	Imaging	Map	Print	Events	Interval	TrigLevel	Auto Record	Used: 00:35	Views	Save	11/08/2021
DataBase	Monitor	Stim	Spl t	Holter	Chart	Protocol	Notes	TrigStim	Show	Start Record	Free: 07:52	Help	Recall	18:38:35

Review Page: 1, Protocol: SIDE BASKET 19:30:47.057



Replay 100 mm/sec A↑ A↓ ↑ ↓ T

19:30:47

Olgu 3

- ▶ 2-3 aydır çarpıntı ve nefes darlığı, 82 yaş kadın hasta
- ▶ LVEF %35, taşikardi induced ?, LA çapı 67 mm

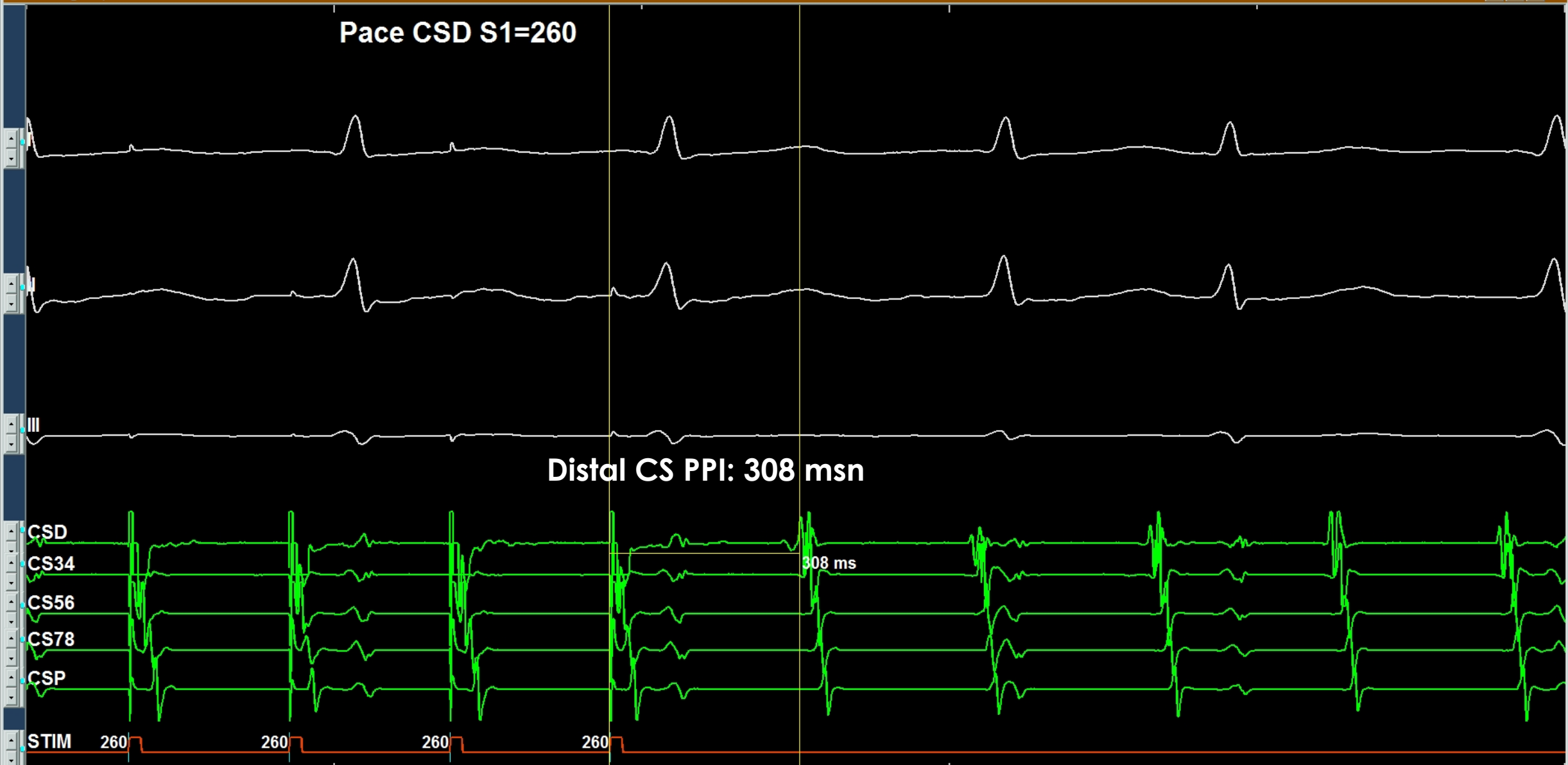


Exit	Setup	Log	RF	Imaging	Map	Print	Events	<input checked="" type="checkbox"/> Interval	TrigLevel	Auto Record	Used: 01:03	Views	Save	11/08/2021
DataBase	Monitor	Stim	Split	Holter	Chart	Protocol	Notes	TrigStim	Show	Start Record	Free: 07:52	Help	Recall	17:44:00

Review Page: 2, Protocol: Ablation w/CS 16:44:50.335

Pace CSD S1=260

Distal CS PPI: 308 msn

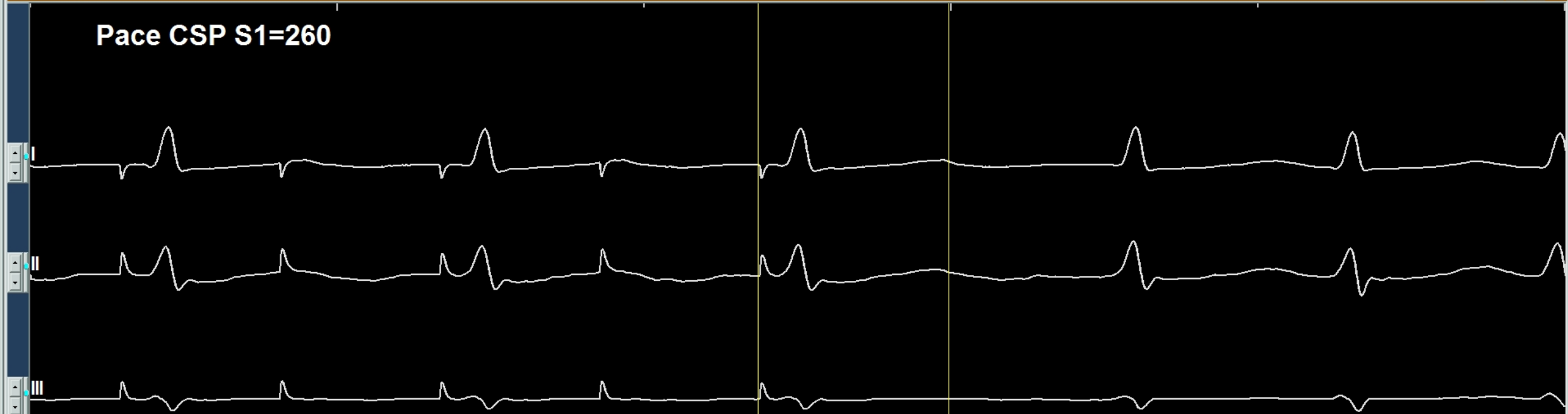


Replay 200 mm/sec 16:44:50

Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 01:03 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 17:44:30

Review Page: 2, Protocol: Ablation w/CS 16:45:10.146

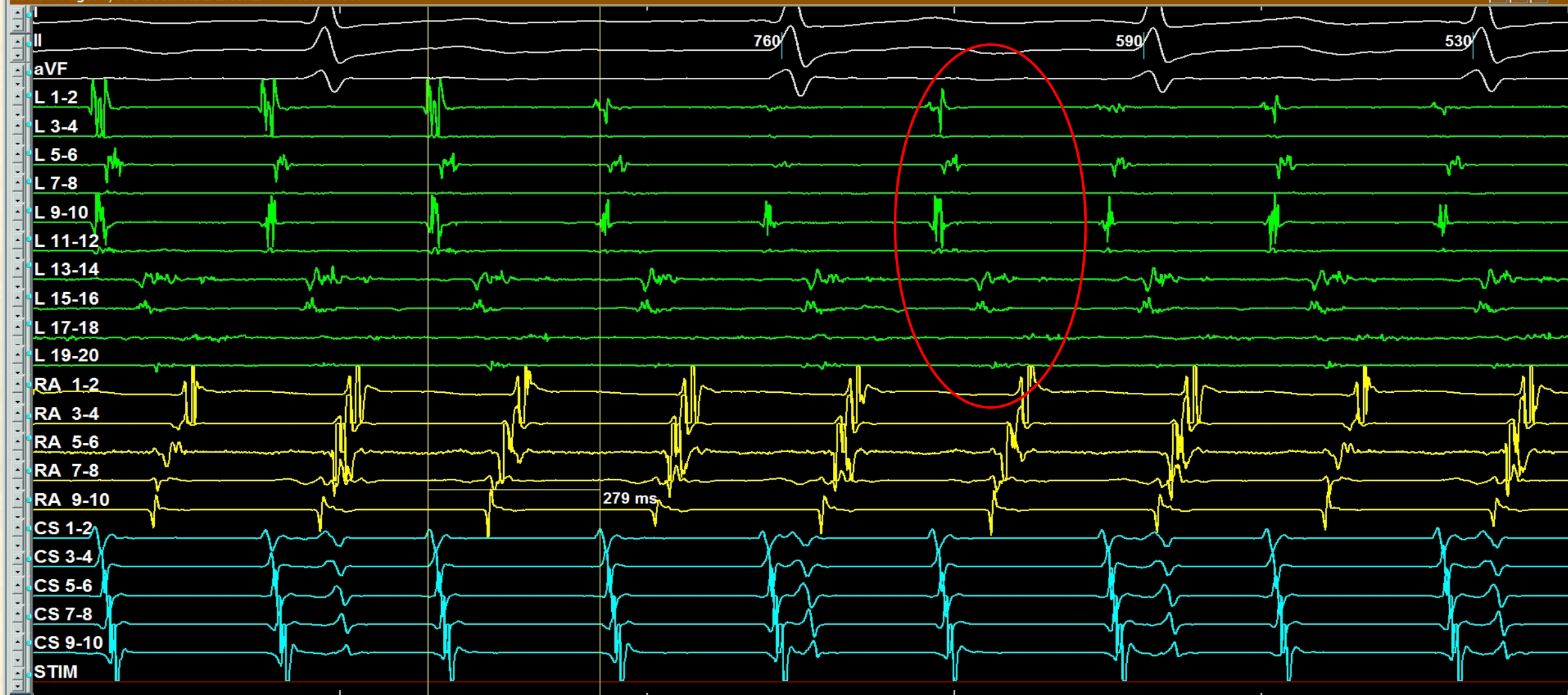
Pace CSP S1=260

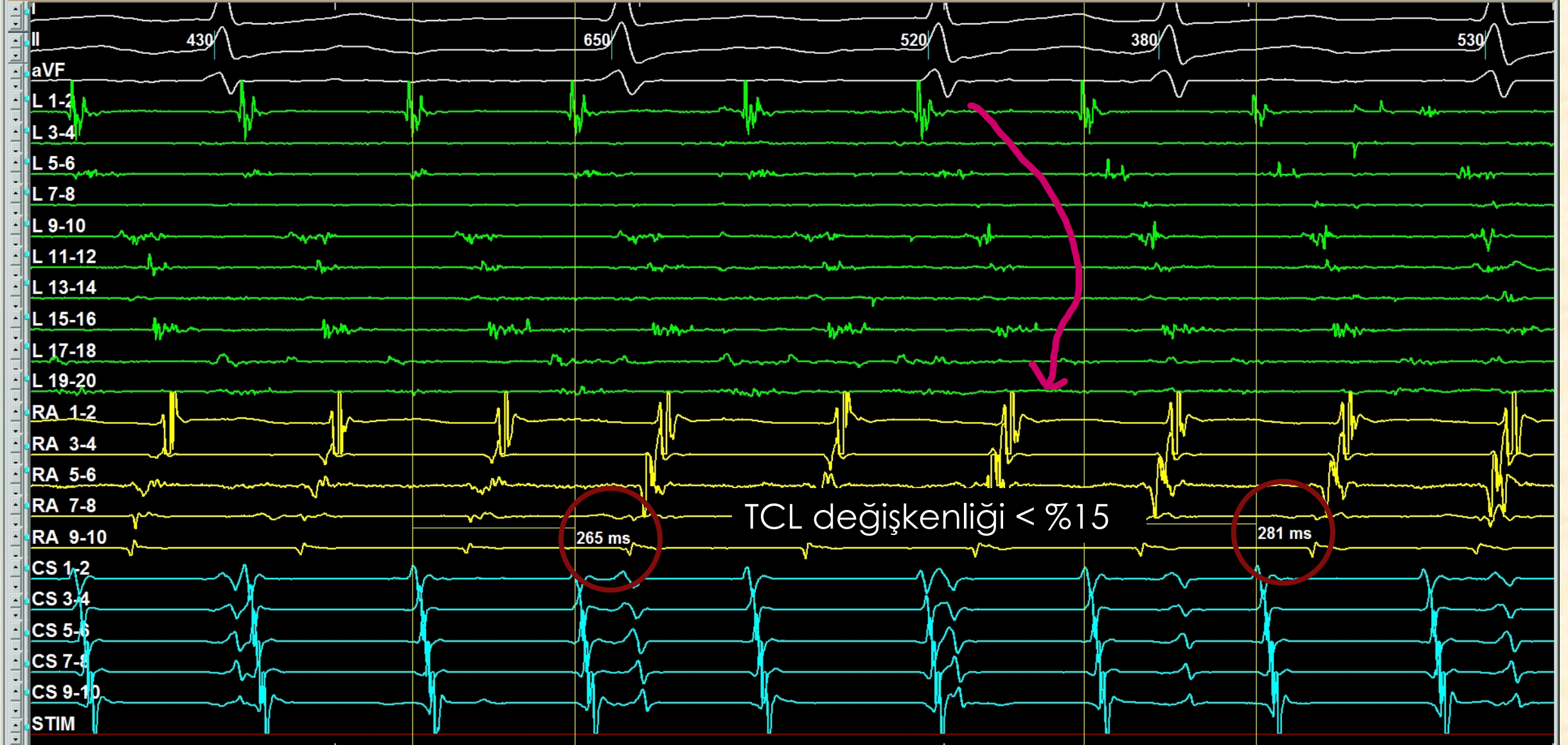


Prox CS PPI: 309 msn



Replay 200 mm/sec 16:45:10







1-Map (1447, 0)

16

Grid icon

Map icon

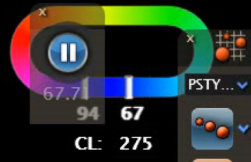
Map icon

Map icon

Map icon



COHERENT

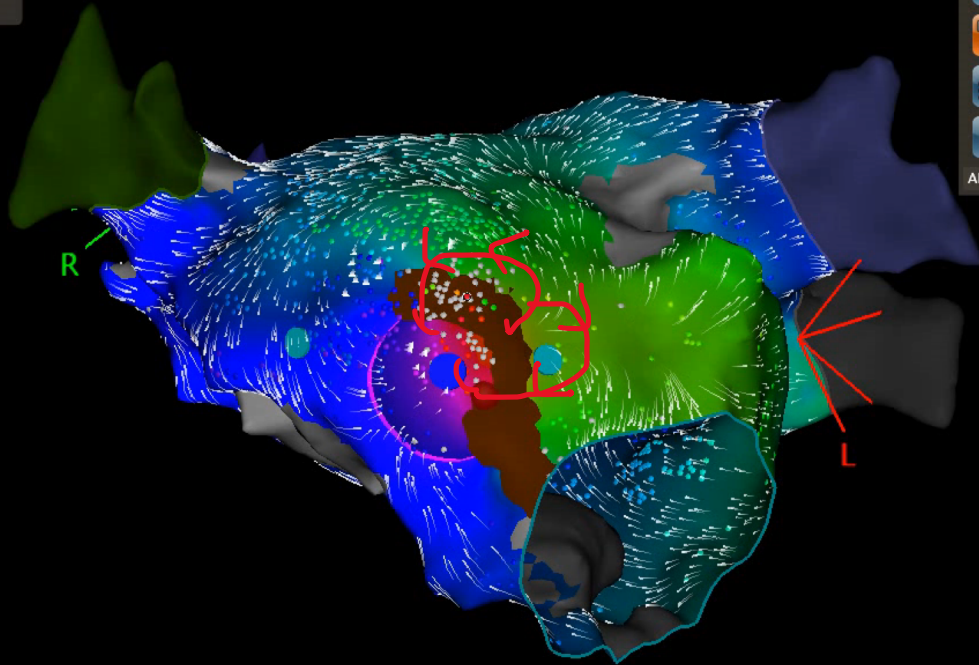


1-Map (1447, 0)

0.20 mV Bi 0.50 mV



fokal reentri tabanlı makroreentran taşikardi



Calculator icon

Calculator icon

Calculator icon

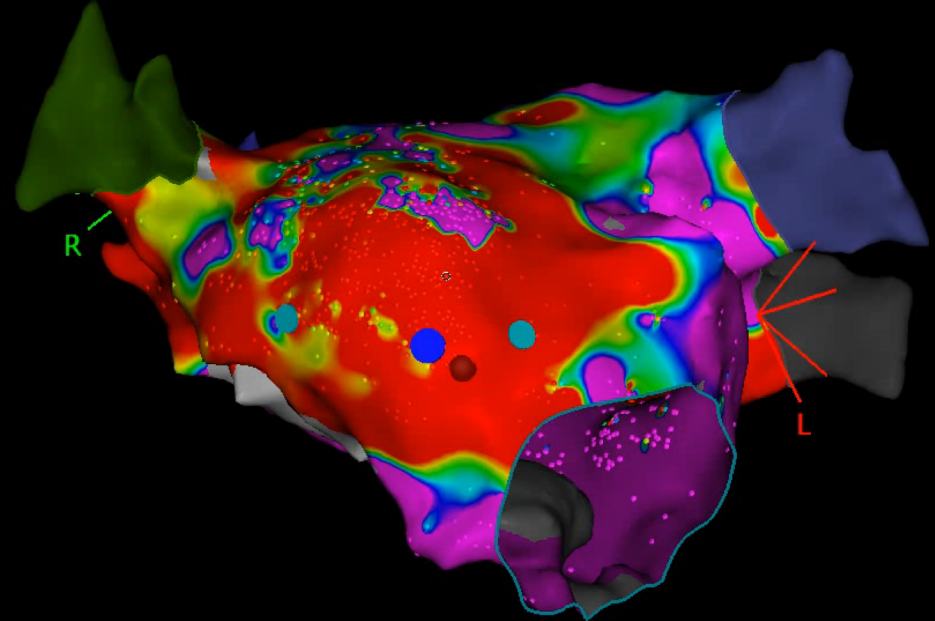
All

1.46



0%

AP PA LAO RAO LL RL INF SUP



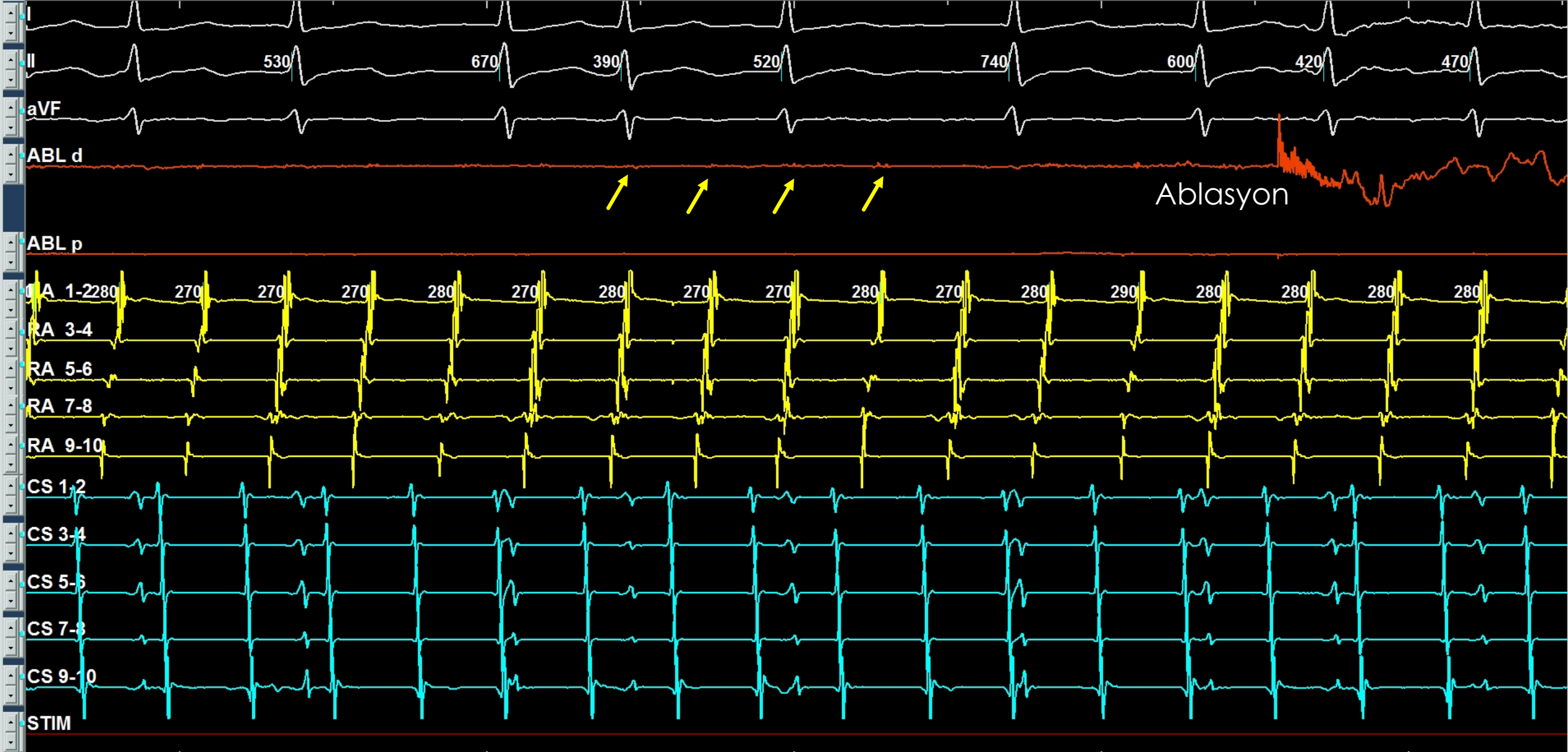
1.46



0%

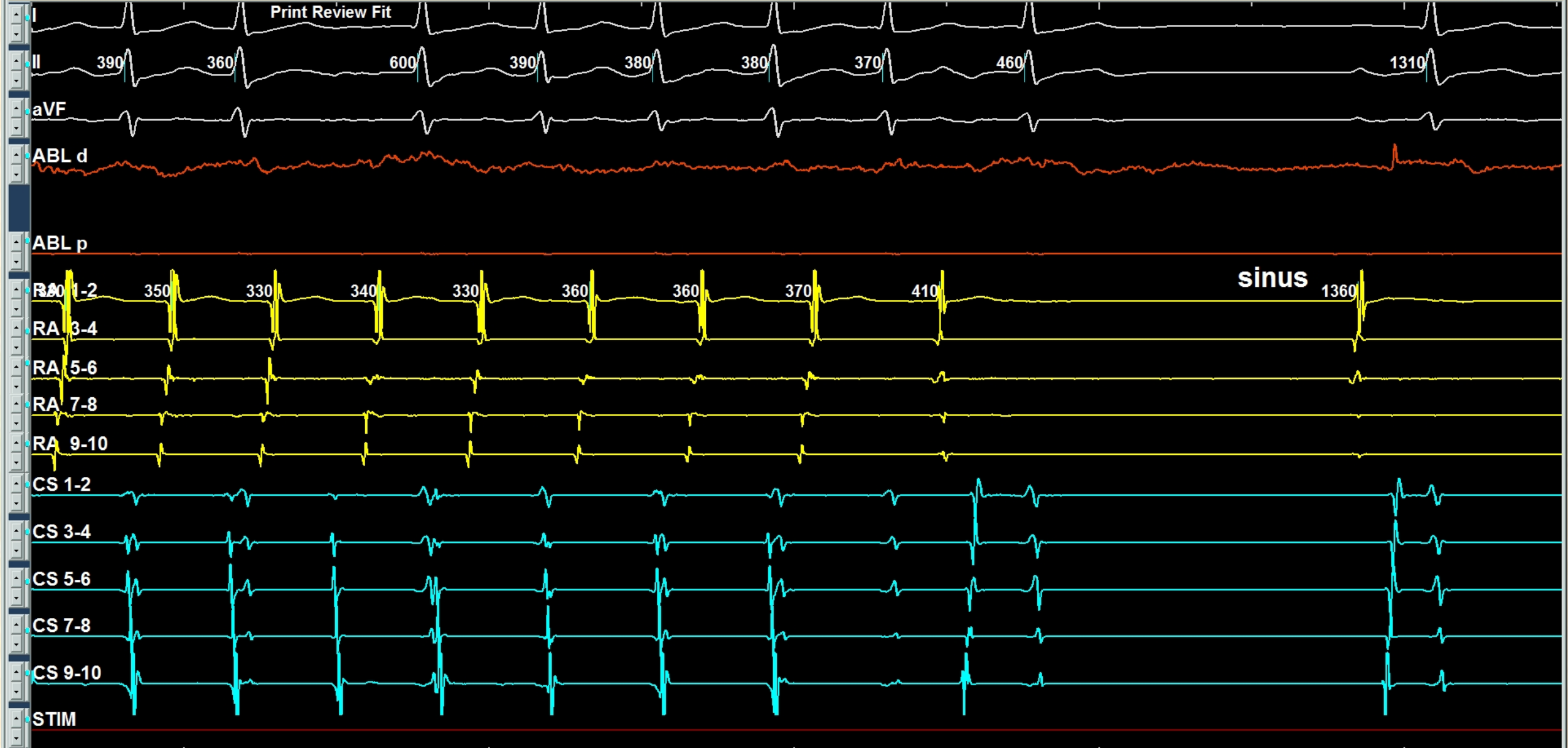
AP PA LAO RAO LL RL INF SUP

Sync



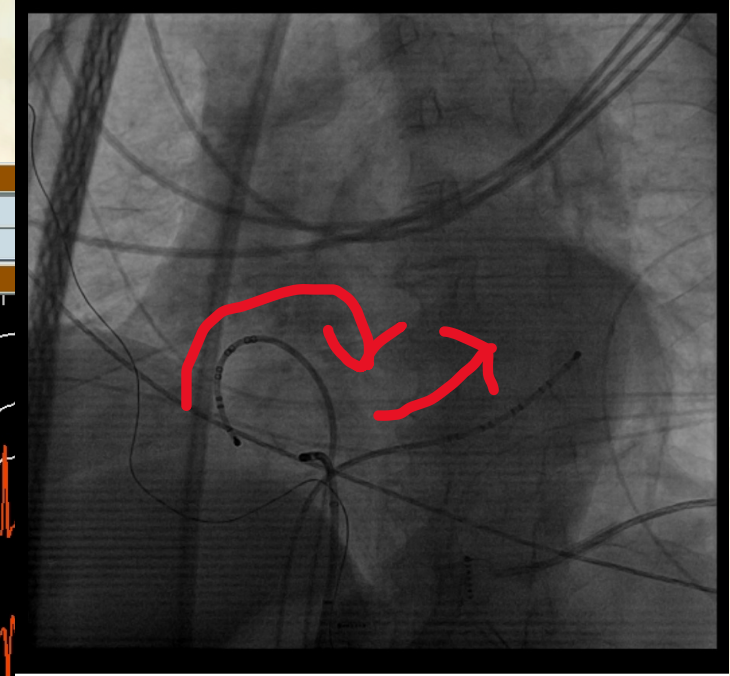
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Review Page: 1, Protocol: SIDE BASKET 17:16:38.373



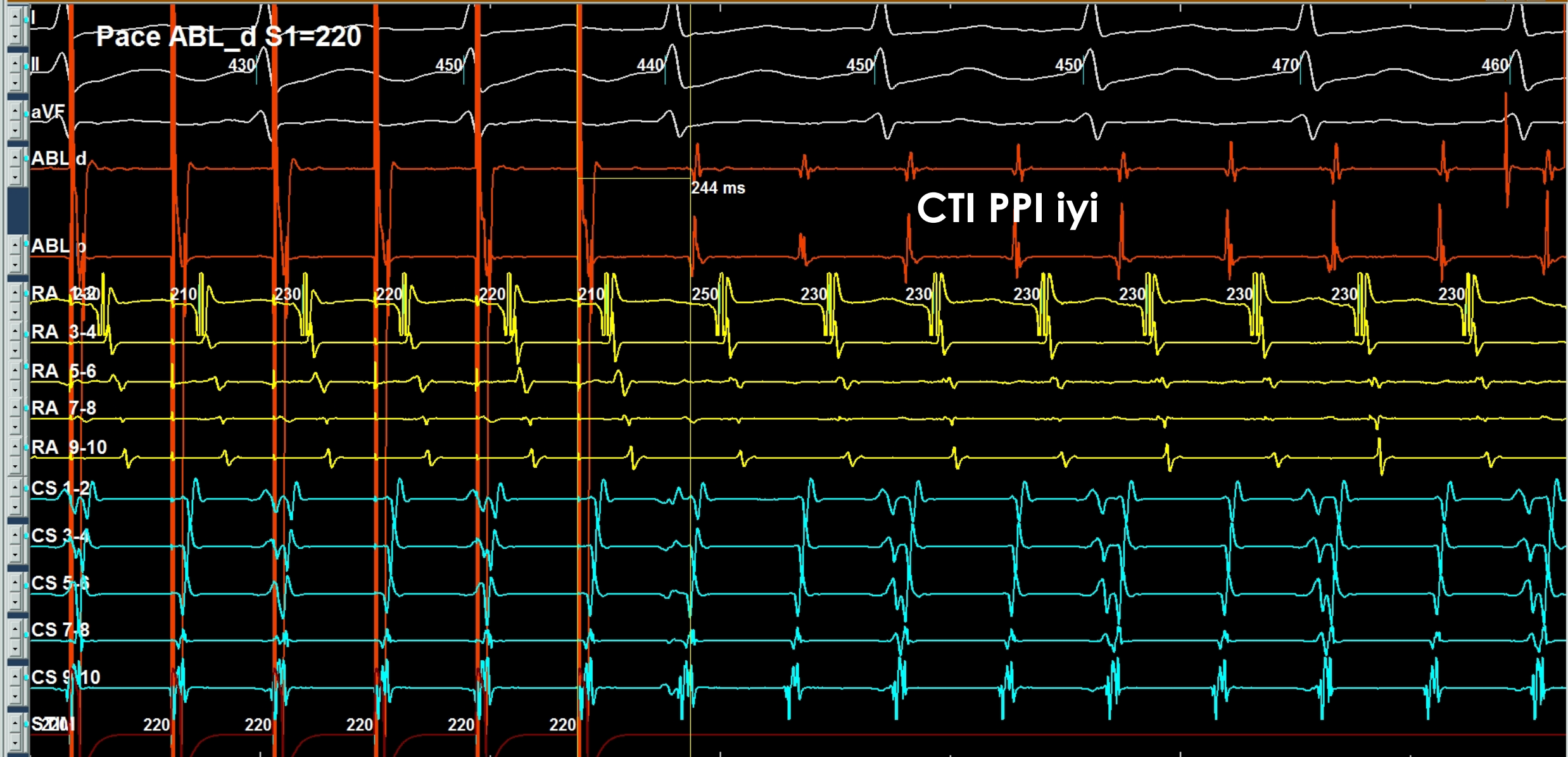
tekrar taşikardi indüklendi
farklı taşikardi !

İkinci taşikardi indüklendi



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:48 Views Save 11/08/2021
Data Base Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 17:45:40

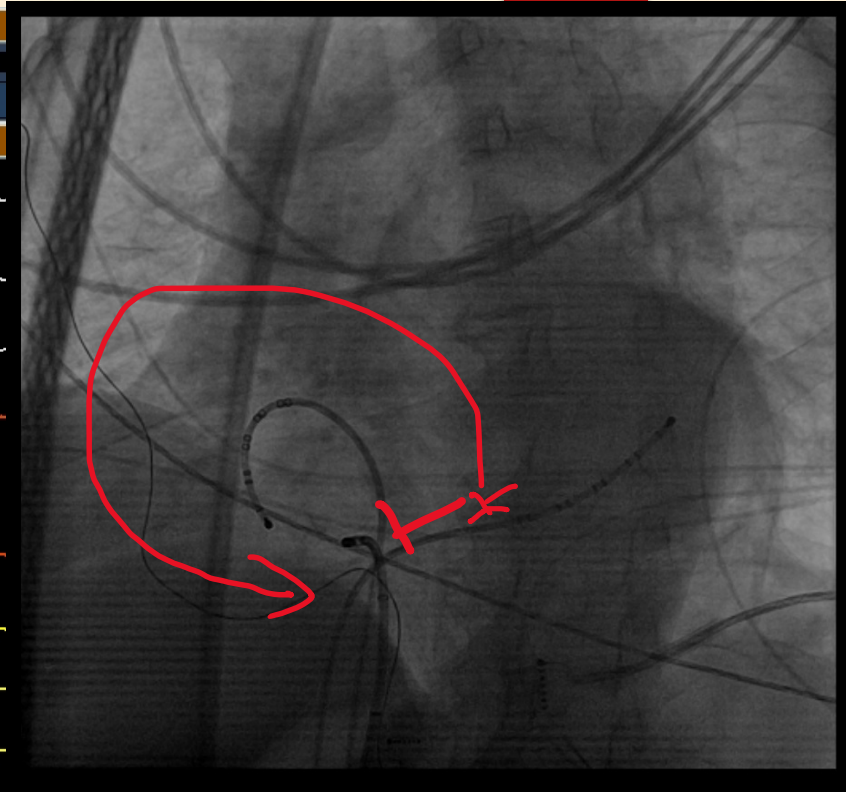
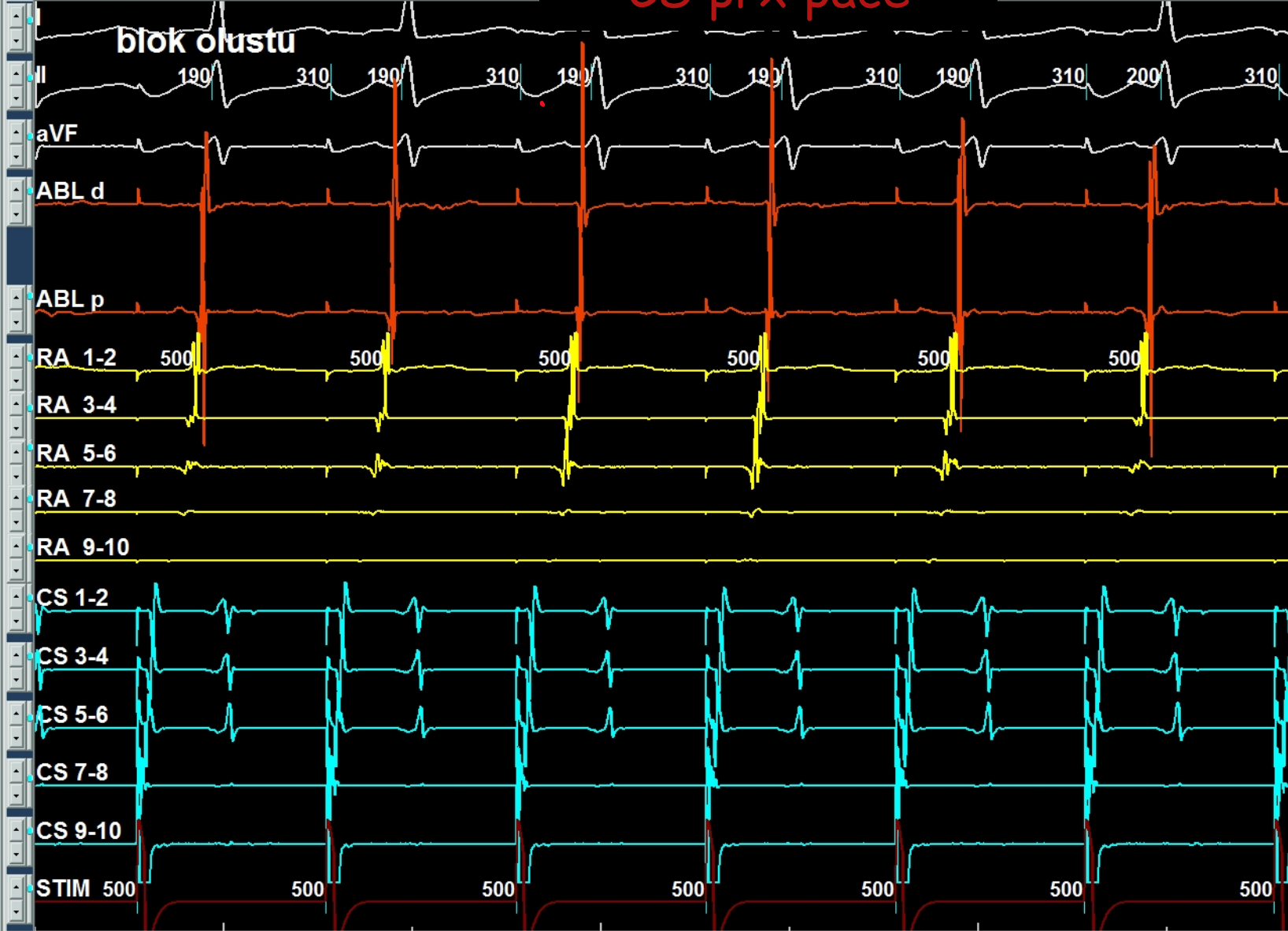
Review Page: 1, Protocol: SIDE BASKET 17:26:13.859



CTI ablasyonu ve sinüs



CTI blok,
CS prx pace



Yas : 82 yıl
Cinsiyet : Kadın
Hasta No : 450712
Uyg. Tarihi : 01/07/2020 13:33:00
Rapor Tarihi : 01/07/2020 13:58:00
Basım Tarihi : 01/07/2020 14:16:54

DOPPLER + RENKLİ + M MODE + B MODE

<u>SOL VENTRİKÜL</u>	<u>SONUÇ</u>	<u>BİRİM</u>	<u>REFERANS</u>
IVSd	13	mm	8-11
ARKA DUVARd	12	mm	8-11
SVDSÇ	58	mm	37 - 56
SVSSÇ	40	mm	23 - 39
KÜÇÜLME	27	%	30 - 44
EF	→ 35	%	55 - 78
SOL ATRİUM	→ 48*67	mm	19 - 40
AORT ÇAPI	34	mm	20 - 39
SAĞ VENTRİKÜL DSÇ	N	mm	< 28
PULMONER ARTER BASINCI	30	mmHg	< 30

YORUM :

RV-RA iç boyutu normaldir. RV fonksiyonları normaldir.
IAS ve IVS intaktır. RVOT, LVOT normaldir.
Aort ve pulmoner arter normal anatomik lokalizasyondadır. Pulmoner arter iç boyutları normaldir.
Aort kapağı üç küspislidir.
Boşluklar ve perikard temizdir.

Sonuç :

- 1) Kalp taşı-aritmikti. AF, Görülebildiği kadıyla
- 2) Sol Ventrikül Sistolik Disfonksiyon; Global Hipokinezi. EF:%35
- 3) Sol atriyum dilate (48*67 mm)
- 4) MY (1/4)
- 5) Aort kapak küspis uçları kalsifik, gradient normal.
- 6) AY (1/4)
- 7) Çıkan aorta dilate (40 mm)
- 8) Sağ ventrikül duvar kalınlığı artmış 9 mm idi.
- 9) Hafif Sol ventrikül Hipertrofisi

Yas : 82 yıl
Cinsiyet : Kadın
Hasta No : 450712
Uyg. Tarihi : 14/10/2020 13:48:00
Rapor Tarihi : 14/10/2020 13:58:00
Basım Tarihi : 14/10/2020 14:24:26

DOPPLER + RENKLİ + M MODE + B MODE

<u>SOL VENTRİKÜL</u>	<u>SONUÇ</u>	<u>BİRİM</u>	<u>REFERANS</u>
IVSd	13	mm	8-11
ARKA DUVARd	12	mm	8-11
SVDSÇ	50	mm	37 - 56
SVSSÇ	36	mm	23 - 39
KÜÇÜLME	28	%	30 - 44
EF	→ 50	%	55 - 78
SOL ATRİUM	→ 43*60	mm	19 - 40
AORT ÇAPI	34	mm	20 - 39
SAĞ VENTRİKÜL DSÇ	N	mm	< 28
PULMONER ARTER BASINCI	30	mmHg	< 30

YORUM :

RV-RA iç boyutu normaldir. RV fonksiyonları normaldir.
IAS ve IVS intaktır. RVOT, LVOT normaldir.
Aort ve pulmoner arter normal anatomik lokalizasyondadır. Pulmoner arter iç boyutları normaldir.
Aort kapağı üç küspislidir.
Boşluklar ve perikard temizdir.

Sonuç :

- 1) Sol Ventrikül Sistolik Disfonksiyon; Hafif Global Hipokinezi. EF:%50
- 2) Sol atriyum dilate (43*60 mm)
- 3) MY (1/4)
- 4) Aort kapak küspis uçları kalsifik, gradient normal.
- 5) AY (1/4)
- 6) Çıkan aorta dilate (40 mm)
- 7) LV diyastolik disfonksiyon (evre1)
- 8) Hafif Sol ventrikül Hipertrofisi

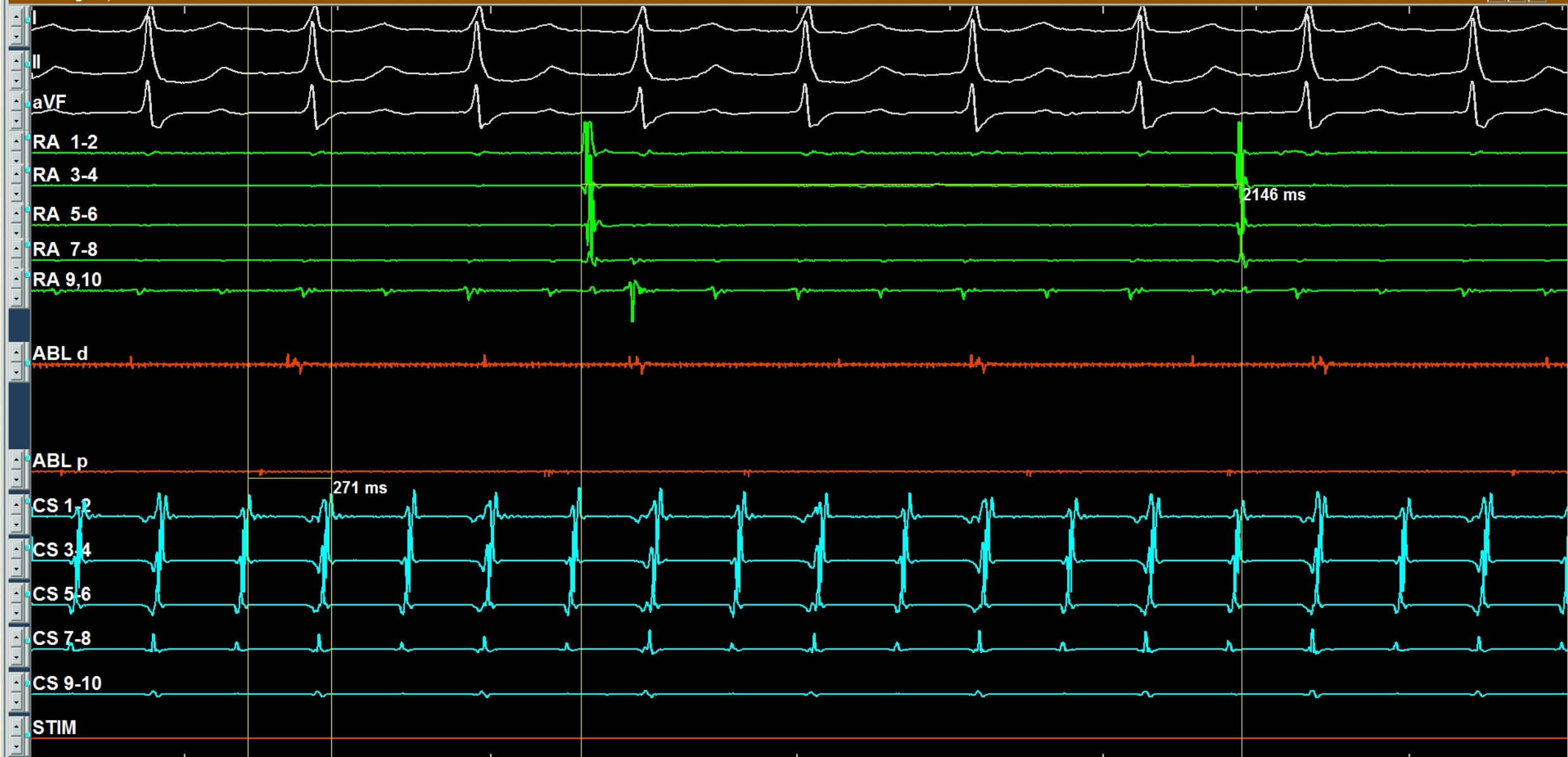
Olgu 4

- ▶ 2 aydır Persistan atrial taşikardi, 54 yaş kadın hasta
- ▶ MVR, cerrahi AF ablasyonu, LA çapı 48x67 mm, EF normal



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:37 Views Save 11/08/2021
 DataBase Monitor Stim Spl t Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 17:48:51

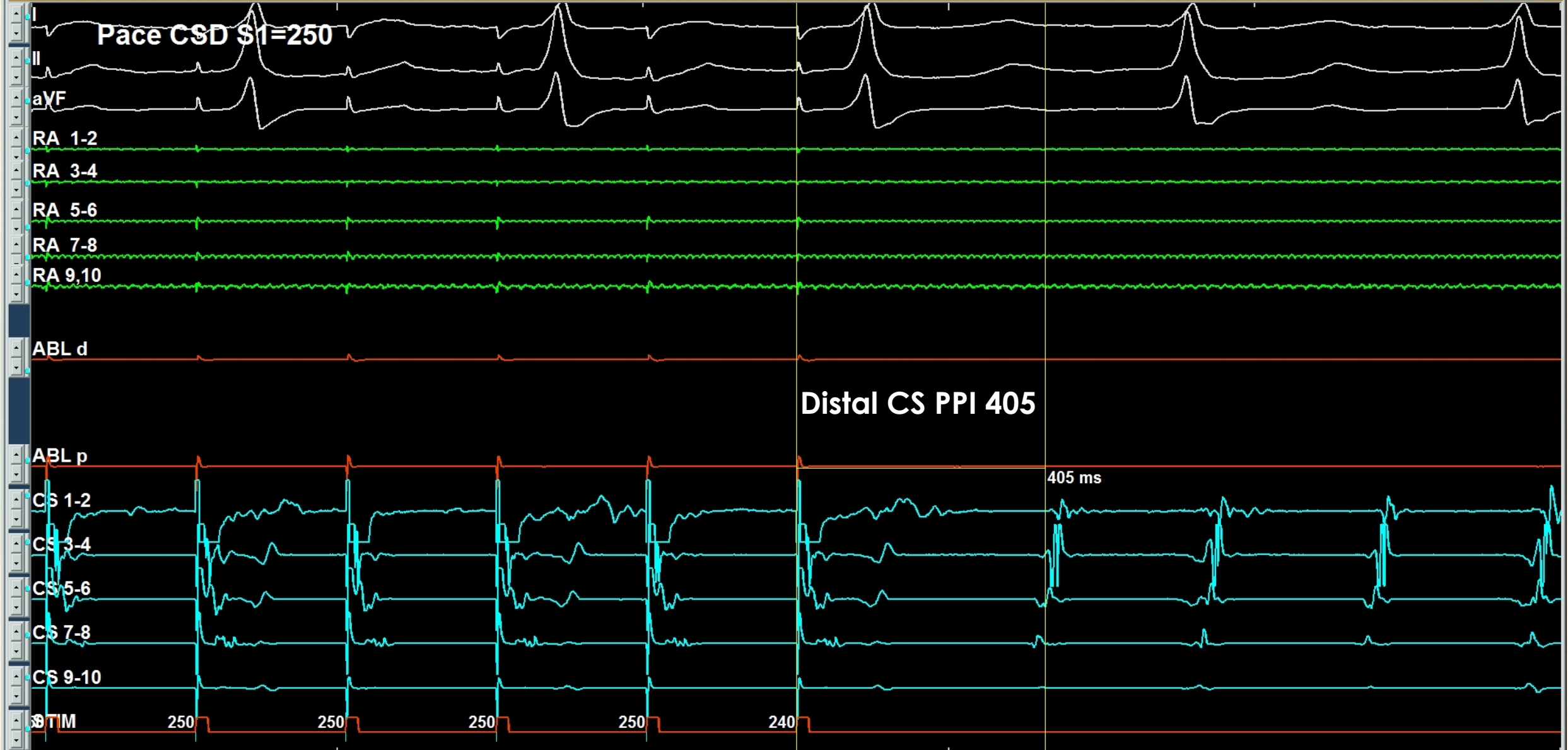
Review Page: 3, Protocol: Ablation w/CS 11:03:46.605

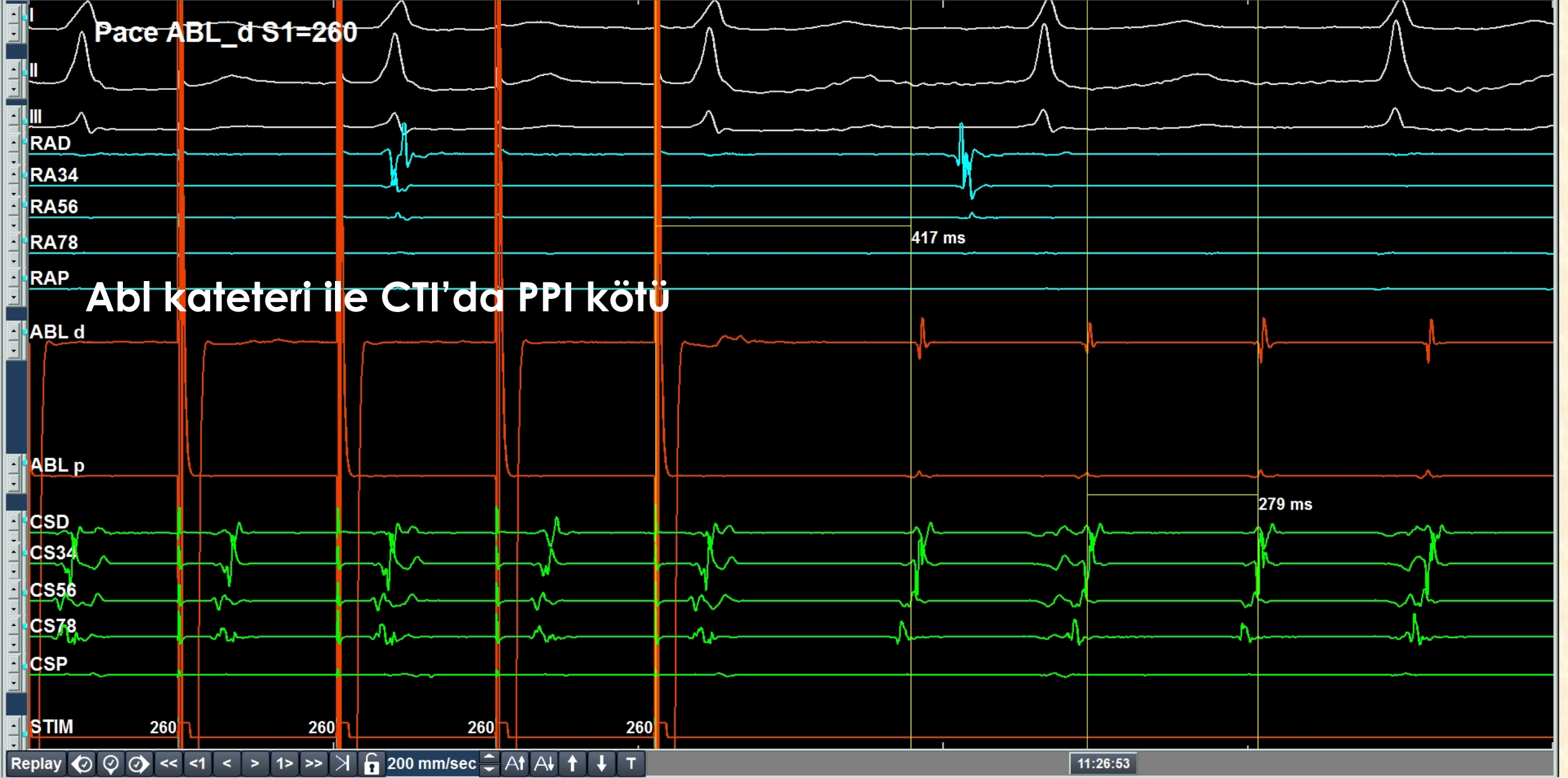


Replay 100 mm/sec 11:03:46

Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:37 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 17:50:14

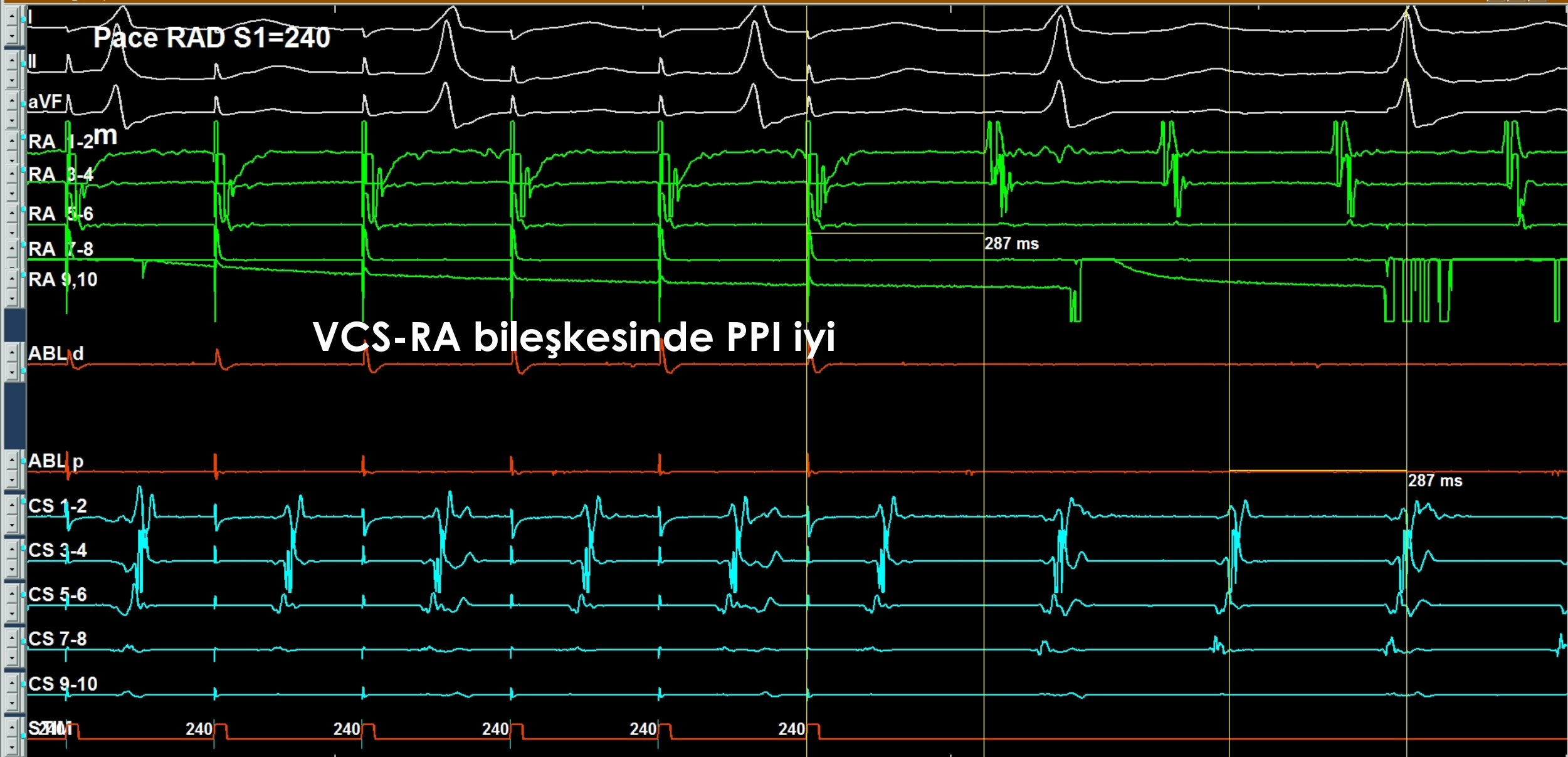
Review Page: 3, Protocol: Ablation w/CS 11:01:37.383





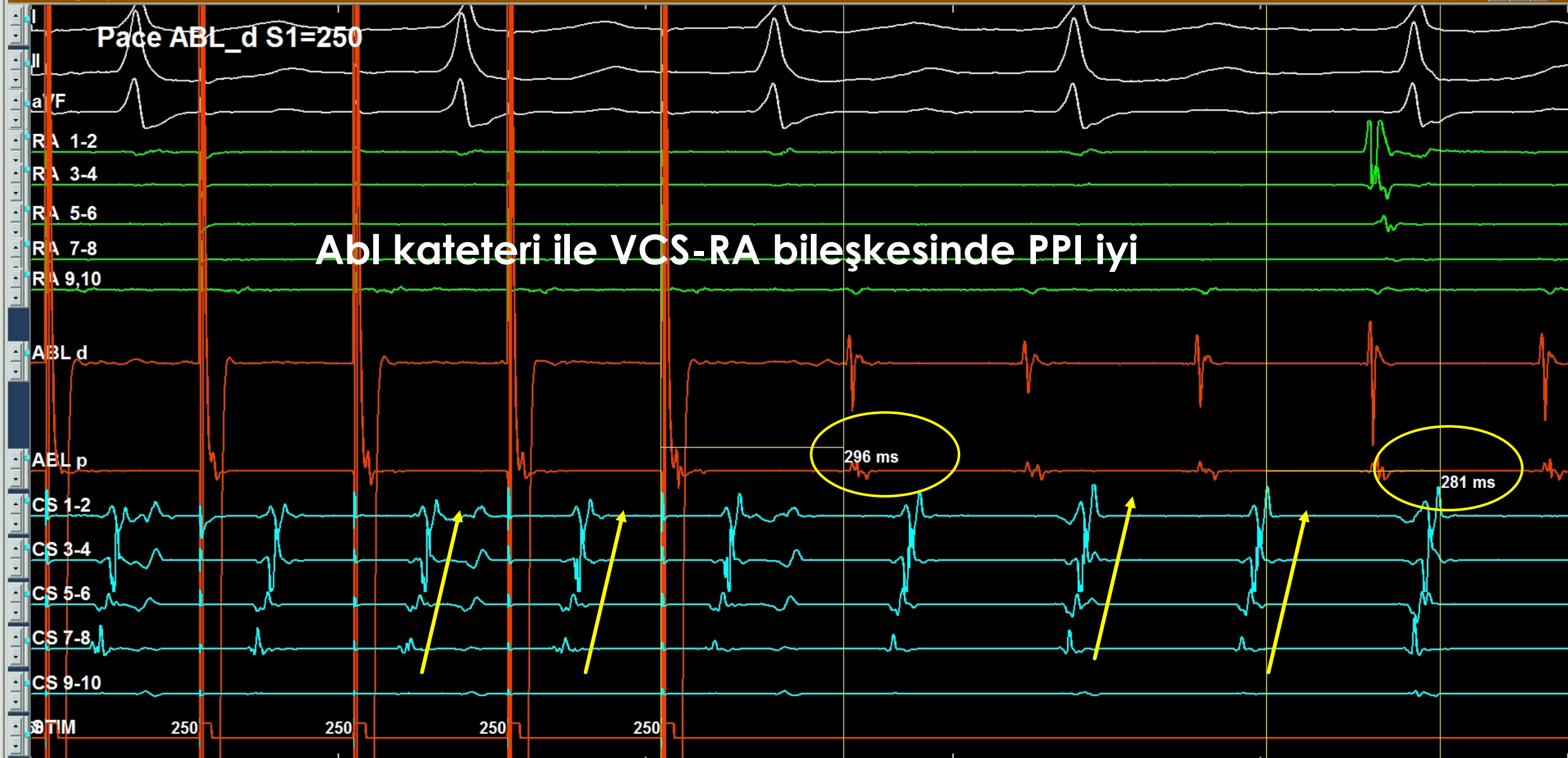
Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:37 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 17:52:15

Review Page: 3, Protocol: Ablation w/CS 11:09:27.976

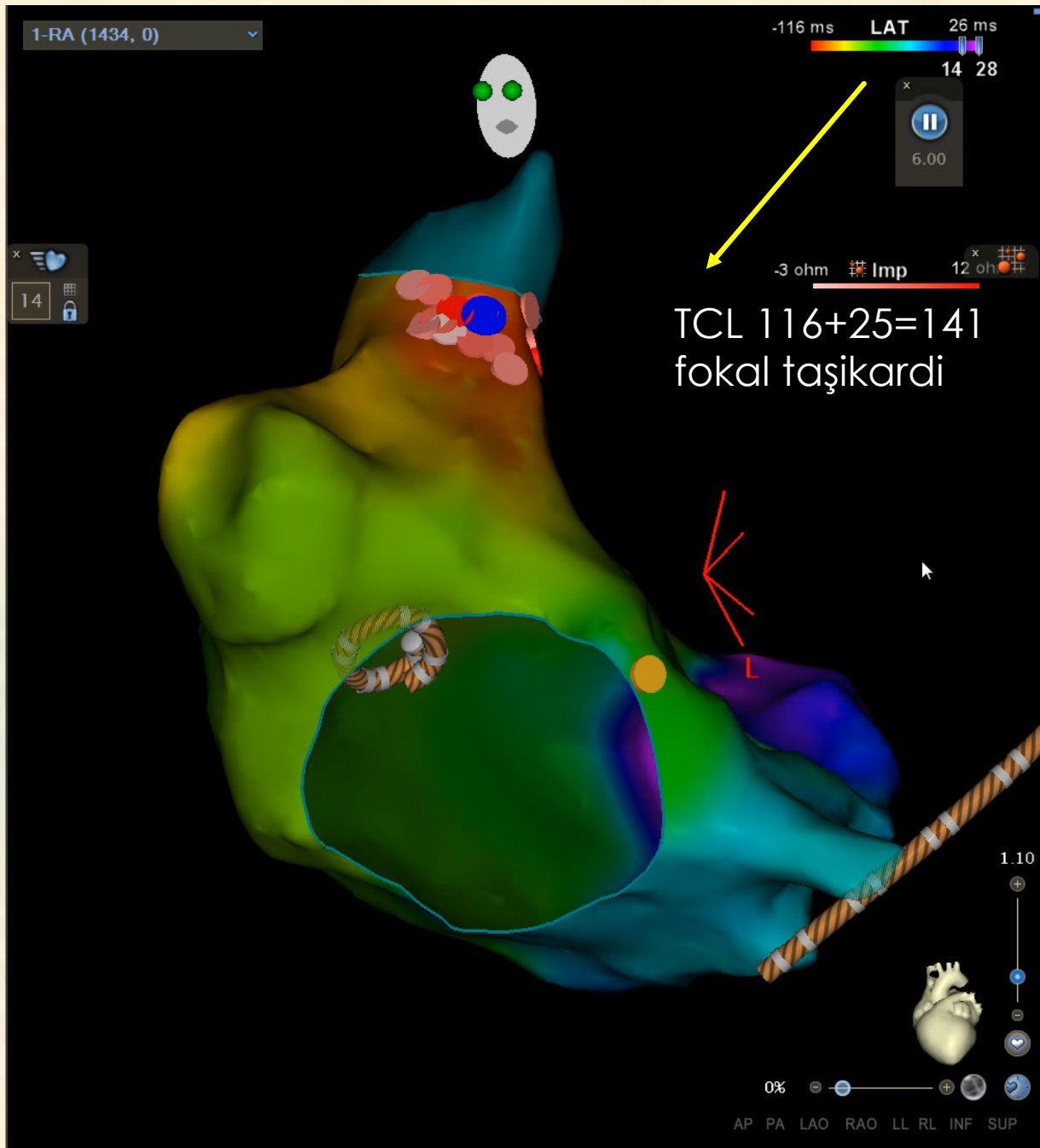


Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:37 Views Save 11/08/2021
DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 17:52:39

Review Page: 3, Protocol: Ablation w/CS 11:19:39.878



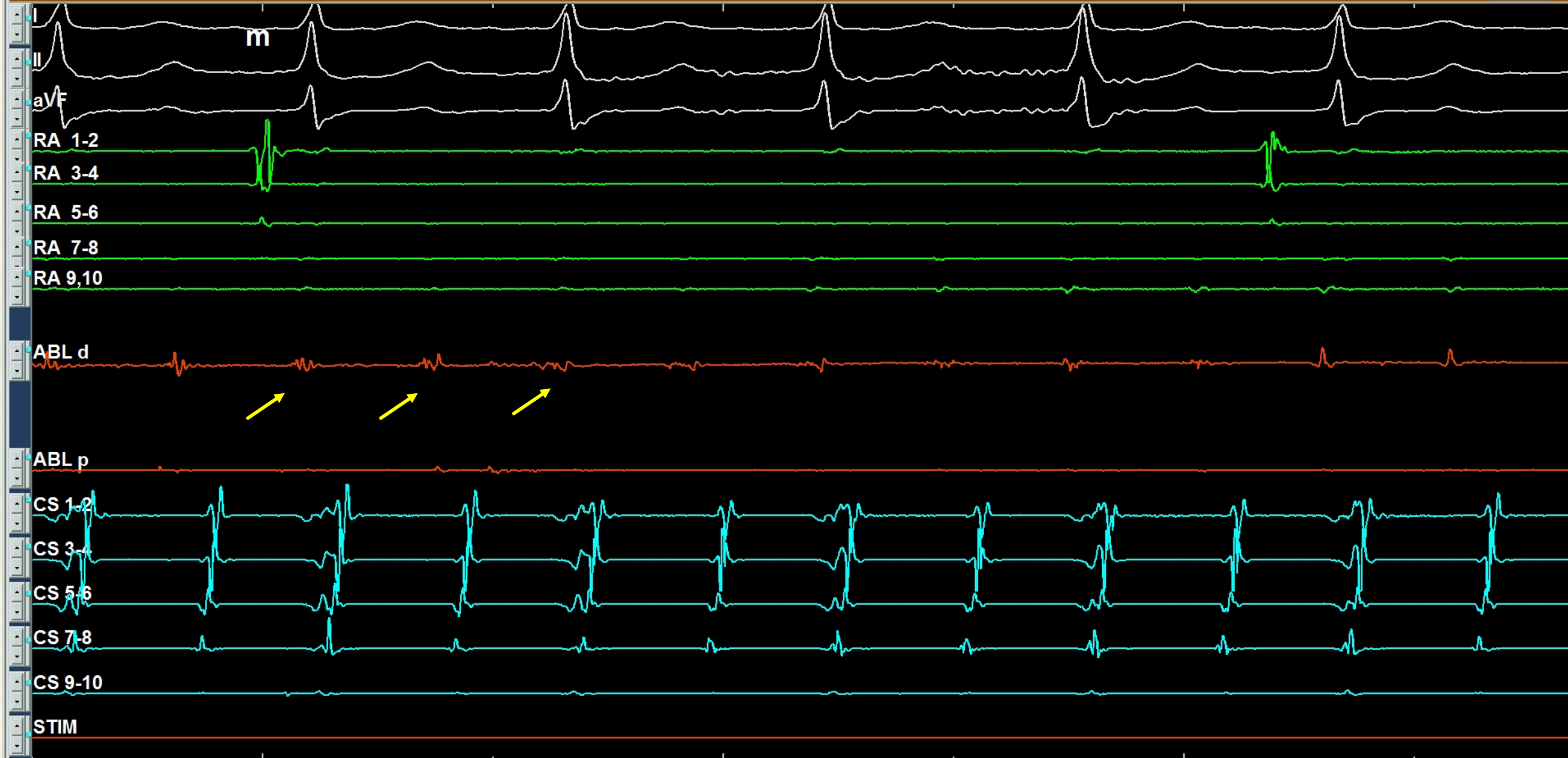
Replay ⏮ ⏪ ⏩ ⏭ 🔒 200 mm/sec ⏴ ⏵ ⏶ ⏷ ⏸



Başarılı olunamadı
LA' ya geçildi

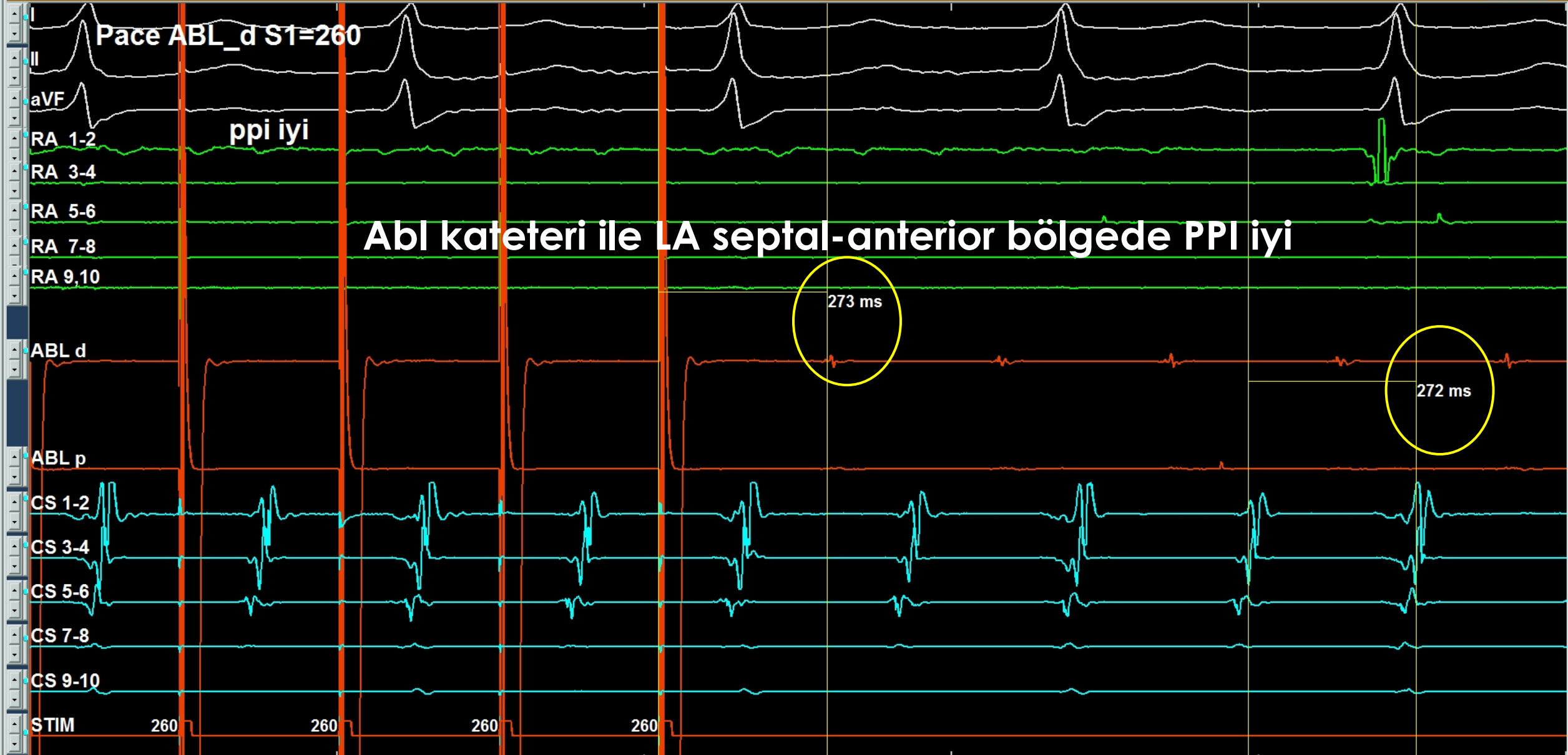
Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:38 Views Save 11/10/2021
DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 04:50 Help Recall 15:19:26

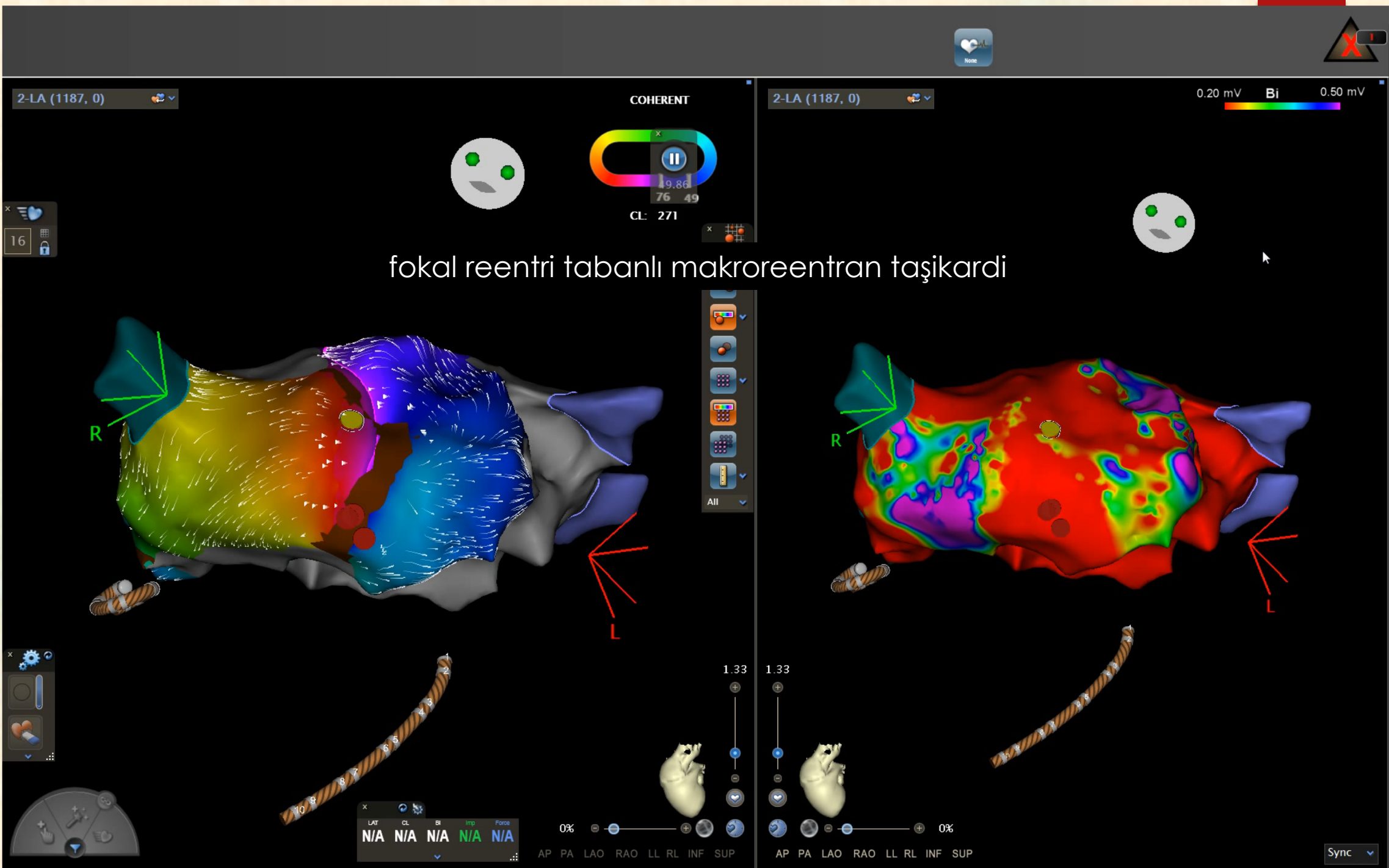
Review Page: 3, Protocol: Ablation w/CS 11:27:38.474



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:37 Views Save 11/08/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall 18:00:56

Review Page: 3, Protocol: Ablation w/CS 11:47:40.485

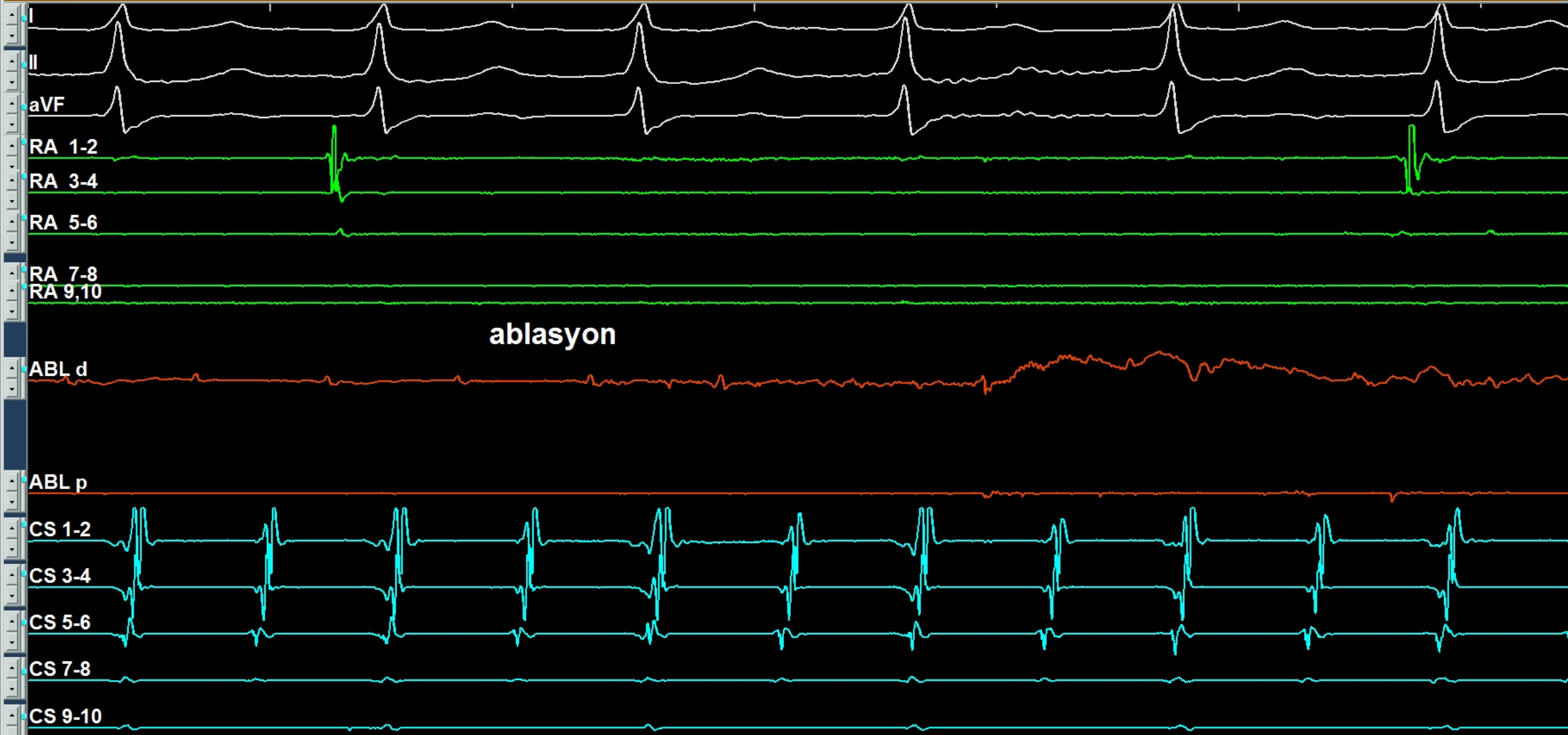




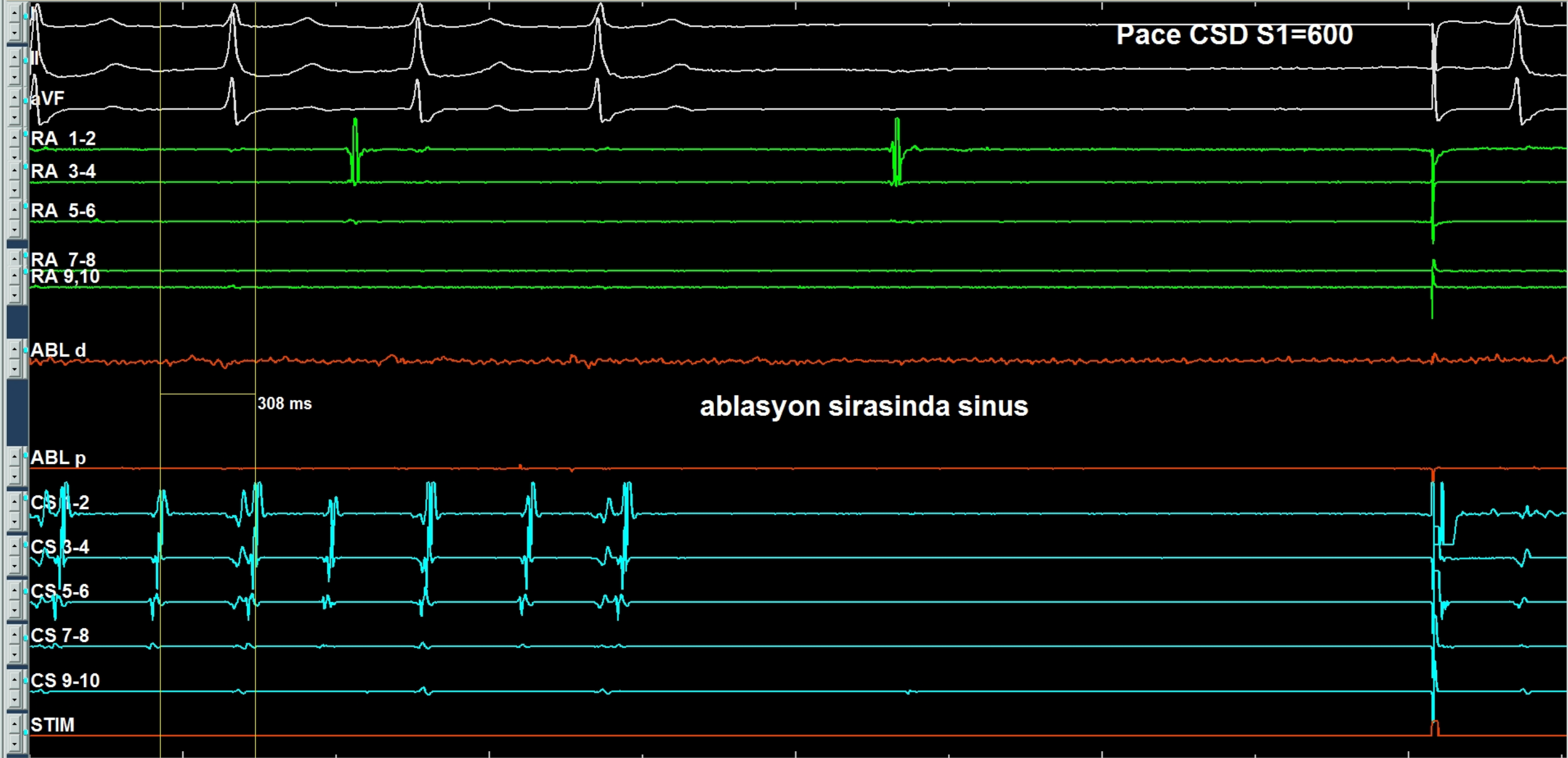
fokal reentri tabanlı makroreentran taşikardi

Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:37 Views Save
DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 07:52 Help Recall

Review Page: 3, Protocol: Ablation w/CS 12:01:12.958



Review Page: 3, Protocol: Ablation w/CS 12:03:29.185



Exit Setup Log RF Imaging Map Print Events Interval TrigLevel Auto Record Used: 00:38 Views Save 11/09/2021
 DataBase Monitor Stim Split Holter Chart Protocol Notes TrigStim Show Start Record Free: 04:40 Help Recall 17:11:41

Review Page: 2, Protocol: Ablation w/CS 12:03:27.724



Replay ⏮ ⏪ ⏩ ⏭ ⏮ ⏪ ⏩ ⏭ 50 mm/sec ⏴ ⏵ ⏶ ⏷ ⏸

Ablasyondan 5 dk sonra: 1 mg atropin





2-LA (1187, 0)

-120 ms LAT 119 ms

-63 -39

-71.00

-3 ohm Imp

Preset

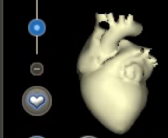
- 12
- Calculator
- Calculator
- Calculator
- Calculator
- All

2-LA (1187, 0)

0.20 mV Bi 0.50 mV

-3 ohm Imp 12 ohm

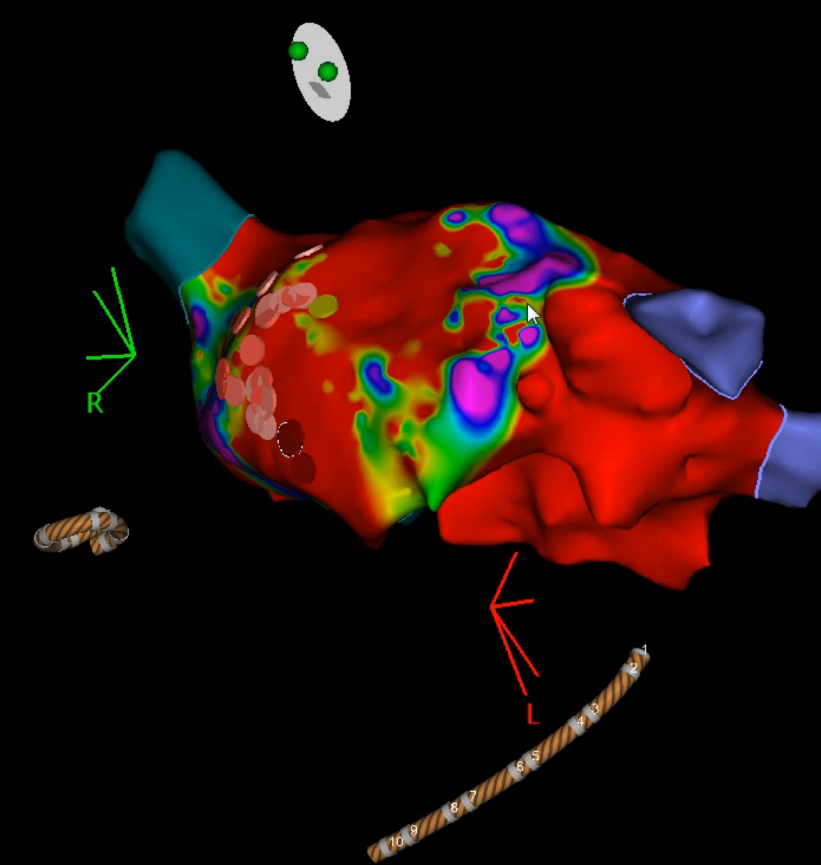
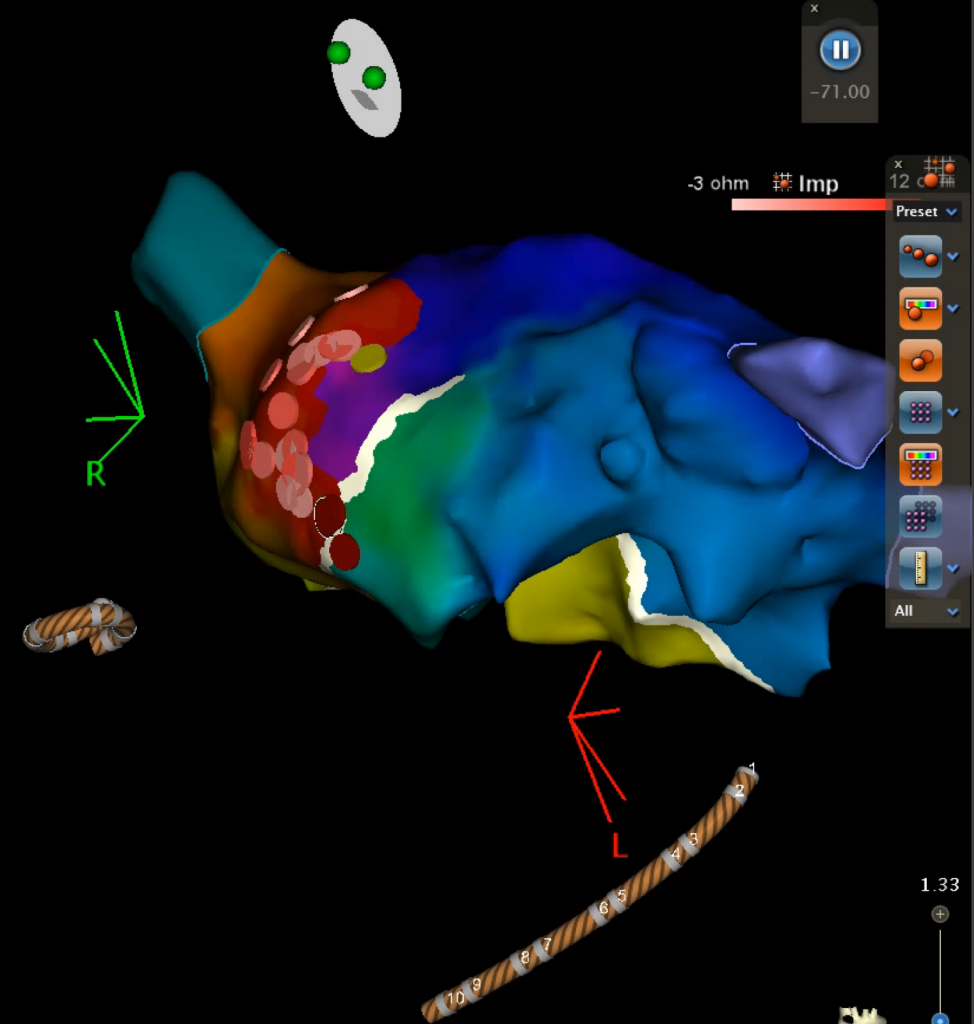
1.33



AP PA LAO RAO LL RL INF SUP

Sync

LAT	CL	BI	Imp	Force
N/A	N/A	N/A	N/A	N/A



16

Settings

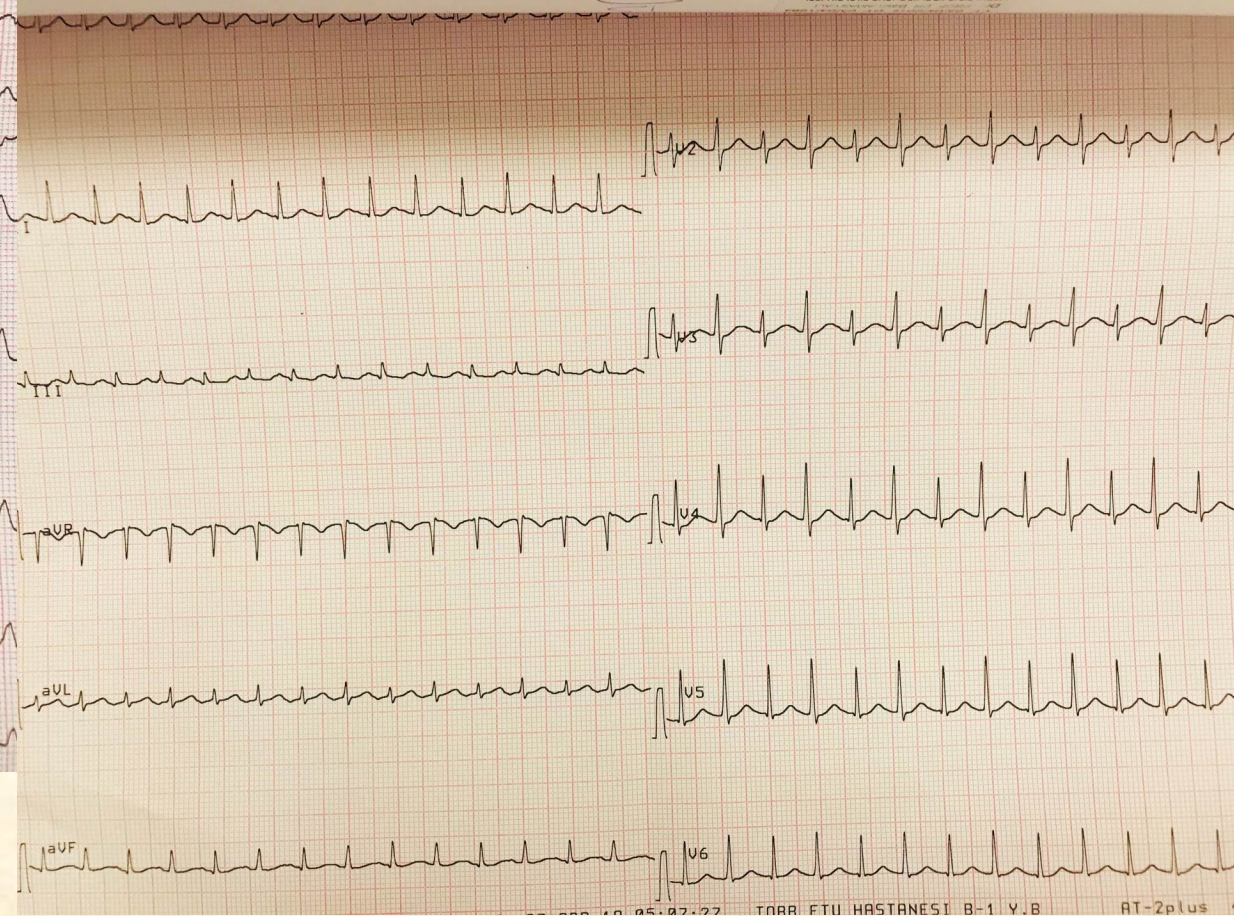
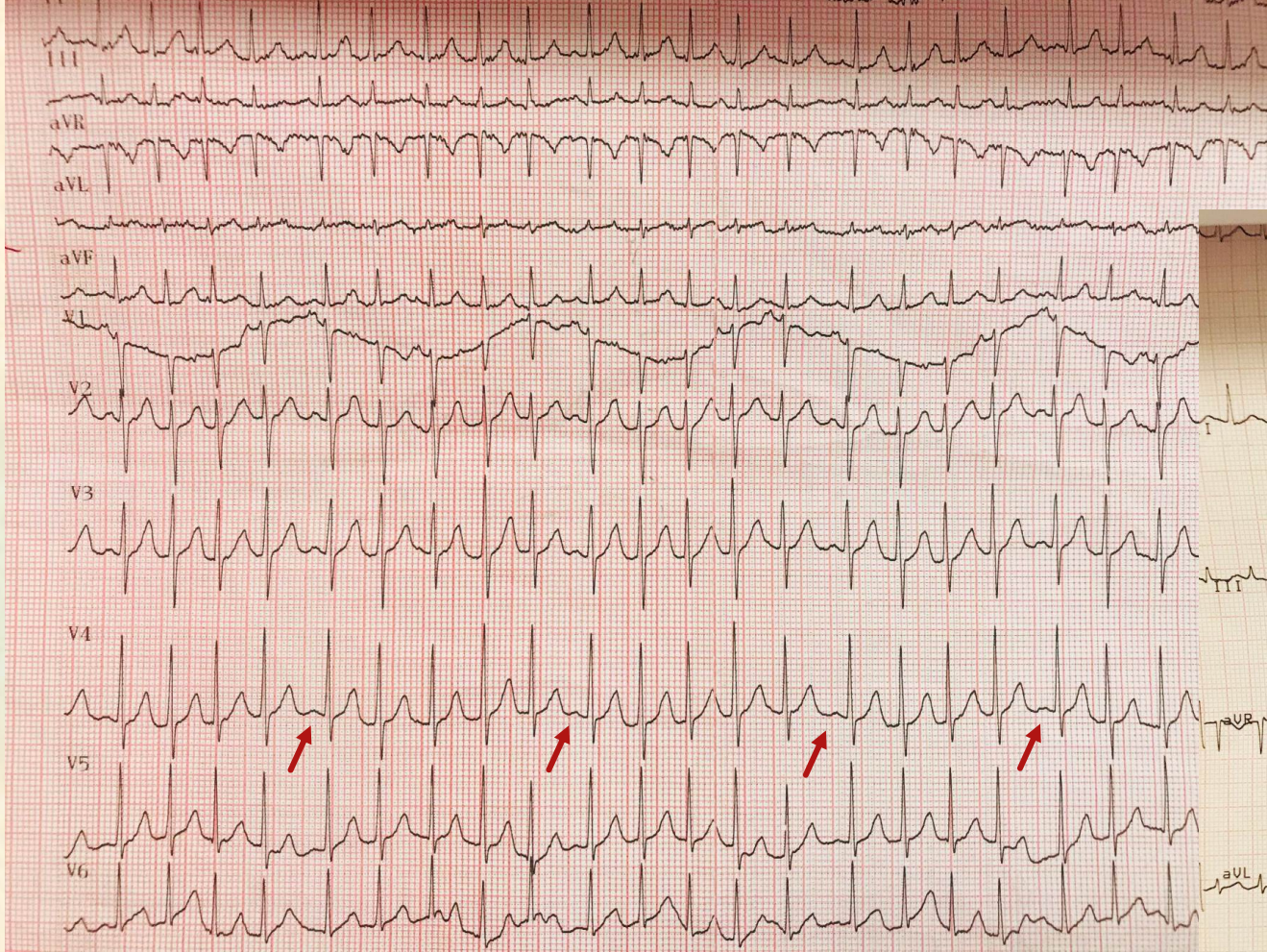
- Volume knob
- Buttons

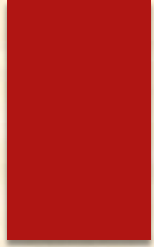
Navigation controls

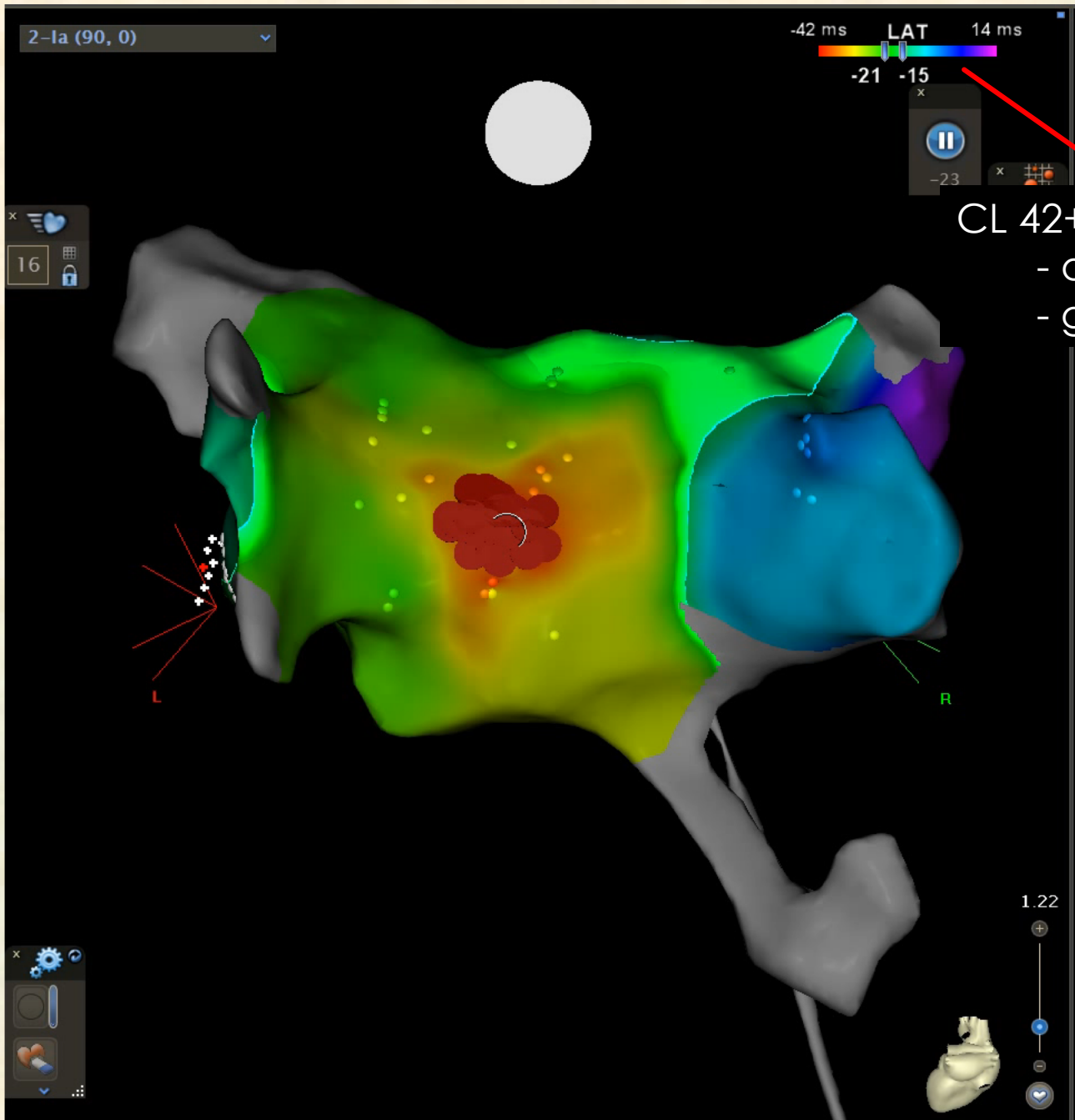
- Buttons for navigation

Olgu 5

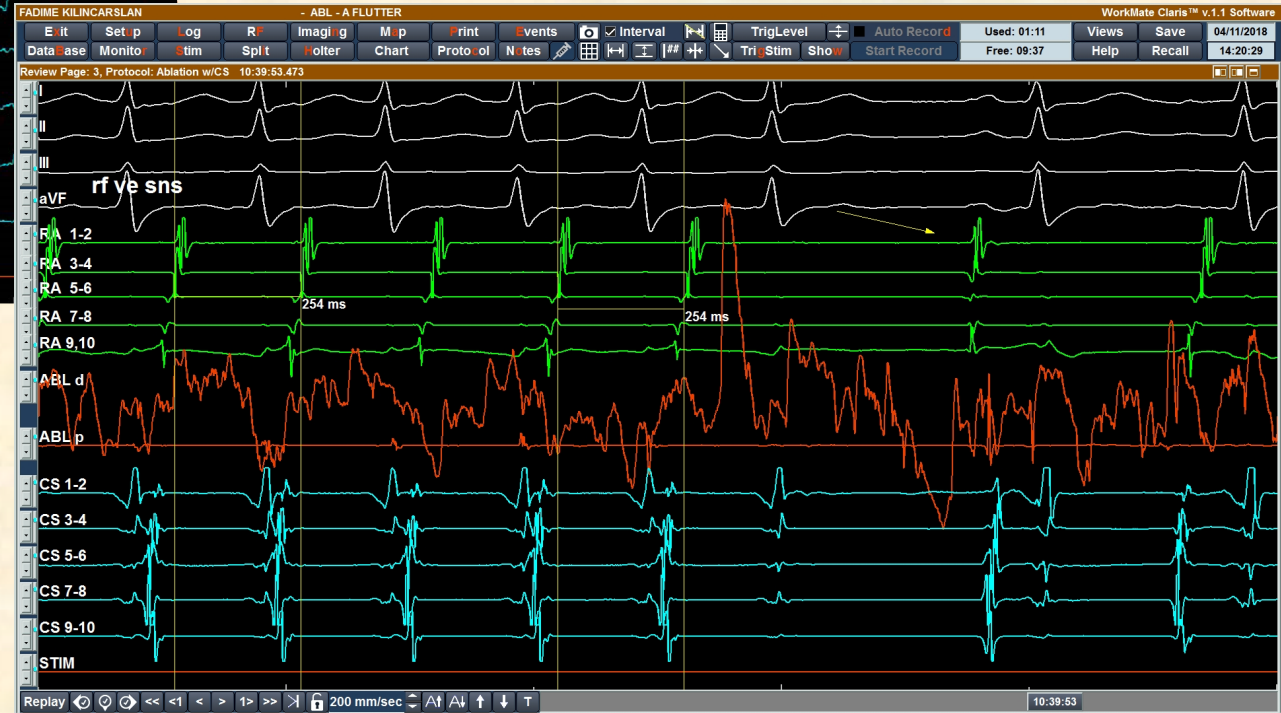
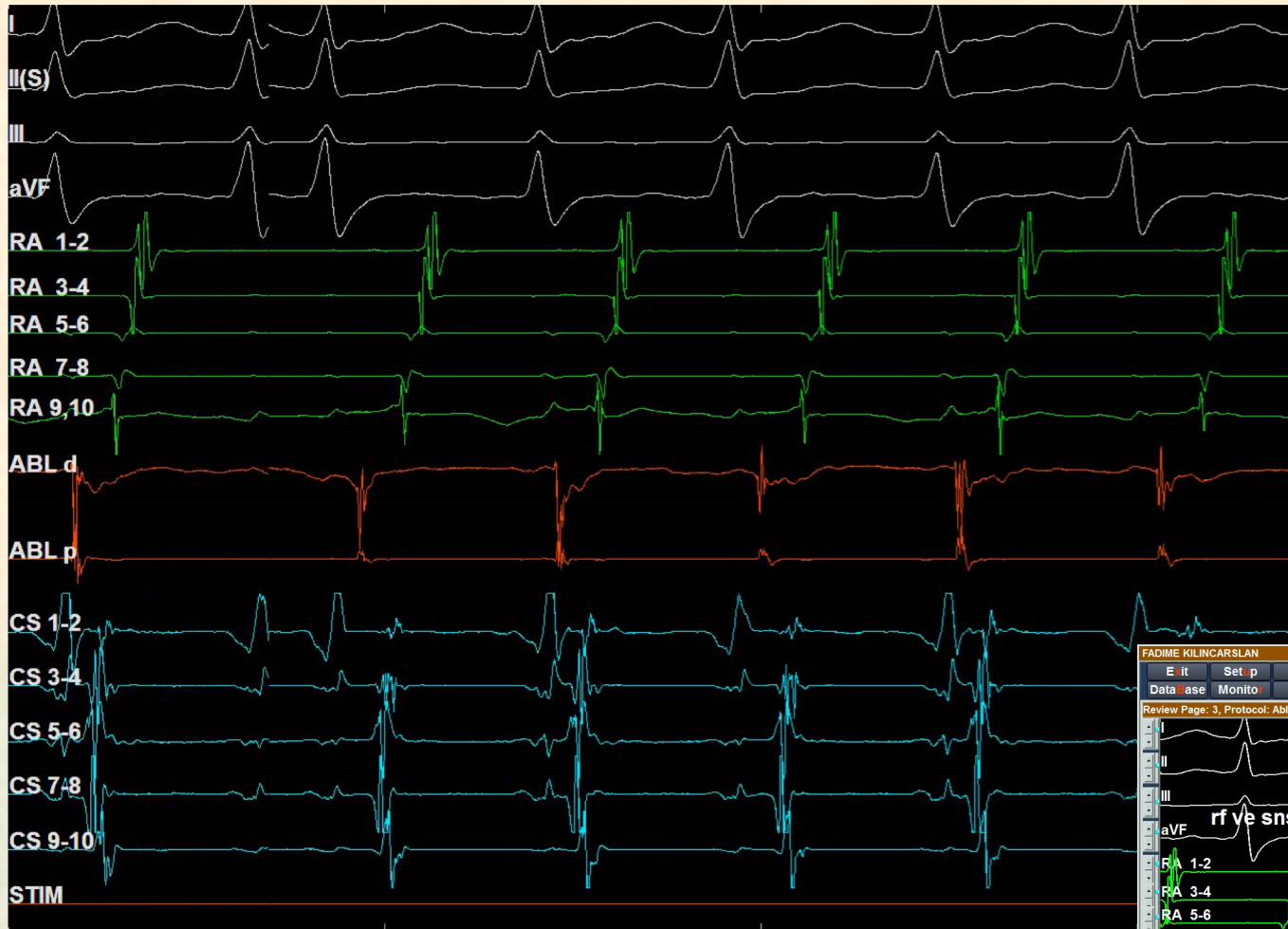
- ▶ 2 haftadır İncessant SVT, 28 yaşında 24 haftalık gebe kadın
Yapısal kalp hastalığı yok, Darob 80 mg tb 3x1 etkisiz





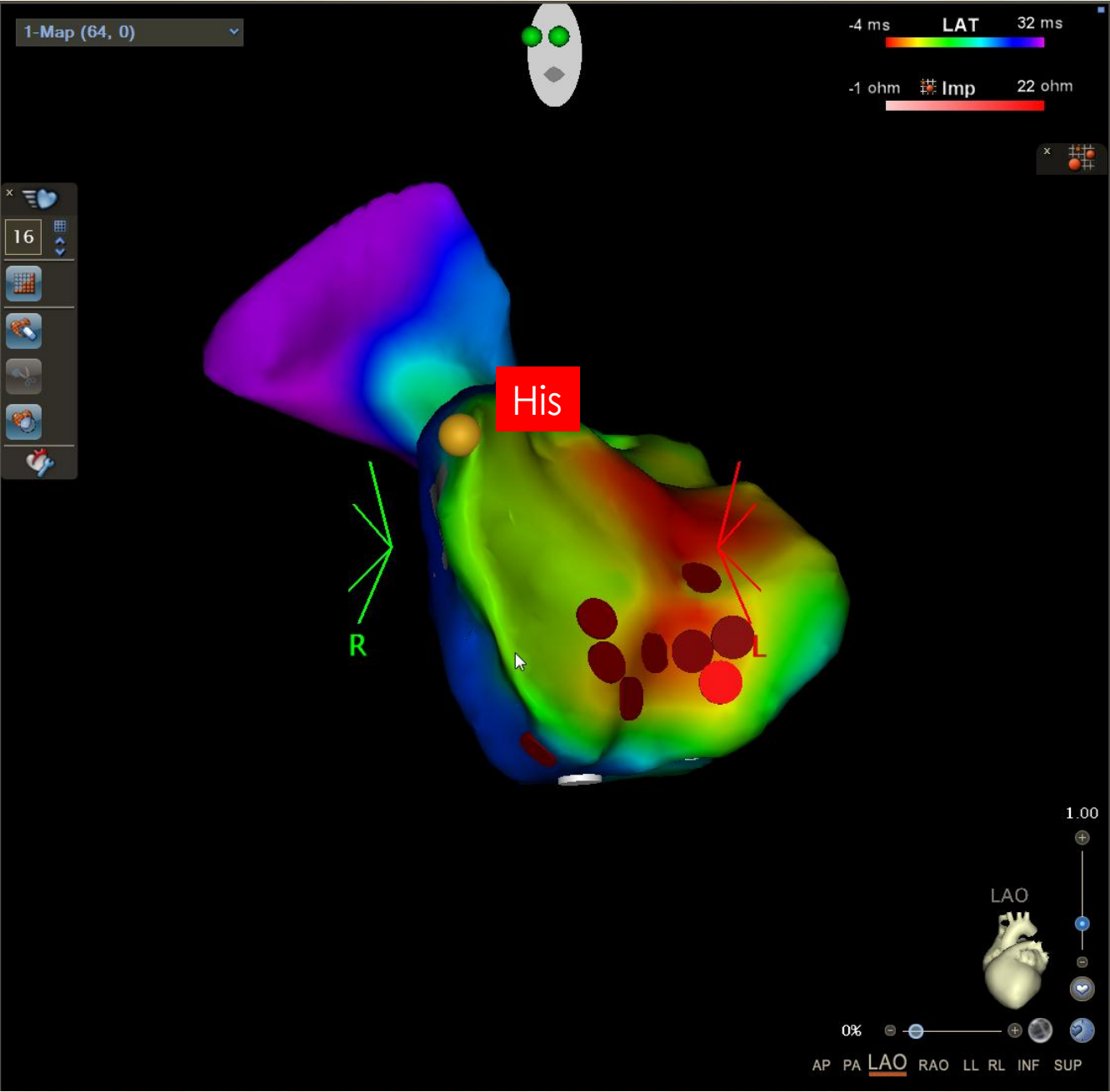


CL 42+14=56 msn: fokal taşikardi
- otomatisme ?
- gerçek fokal taşikardi



Ablasyon sonrası indüksiyon





FADIME KILINCARSLAN***SILME***

Patient Exam Event Log **Run Log** Request History Report

Run	Images	Time	Procedure	Rotation	Angulation	kV	mA[s]	ms
1	20	09:52	Fluoroscopy	+32	0	87	5	0

Cumulative Air Kerma

5.82 mGy

Cumulative DAP

2152 mGy^{cm}²

Fluo time

01:10

OK

Cancel

Sonuç olarak AT ablasyonlarında;

- ▶ CS aktivasyonu ve Entrainment teknikleri ile hangi atriyum ?
- ▶ Davranış şekli, 3-D mapping aktivasyon haritasına göre mekanizmasının belirlenmesi
- ▶ Fokal
 - ▶ En erken yer
 - ▶ Fokal reentri kaynaklı ise fraksiyone, düşük amplitütlü uzun kayıt veren noktalar tespit edilmeli
- ▶ Makroreentran taşikardi düşünüyorsak
 - ▶ TCL'nin > %70-75'i aktivasyon haritasında ortaya konabilmeli
 - ▶ Kritik itimus belirlenmeli ve lineer lezyonlar
- ▶ Kompleks vakalarda mümkünse yüksek rez. mapping kateterleri
 - ▶ Substratı daha iyi ortaya koymakta
 - ▶ Aktivasyon haritası daha net
 - ▶ Zaman kazanma

Özel not;

- ▶ Hamile kalmayı düşünen taşiaritmisi olan hastalarımızda
 - ▶ Hamilelik öncesi EPS ve ablasyon yaptırmaları konusunda bilinçlendirme



**Teşekkür
Ederim**

