Supraventriküler Taşikardi Ablasyonu Yöntem, İpuçları ve Çözümler

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AF zirvesi 2015

Türkiye Yüksek İhtisas Hastanesi EPS Ekibi

3D Başarı =

- Fökal, Reentry ayrımı
- Anotomik komşulukların iyi bilinmesi
- Doğru boşluktan emin olmak ve complet mapping
- Doğru ve stabil referans seçmek

- Her aritmide mutlaka skar mapping yapmak
- Doğru “window of interest”
- “Isochronal steps “ üzerinen analiz ve reentry halkasını tam olarak çıkarmak
- Istmusu hedeflemek

Haritalama yaparken dikkat edilecek noktalar

- Anormal elektrogramları işaretle

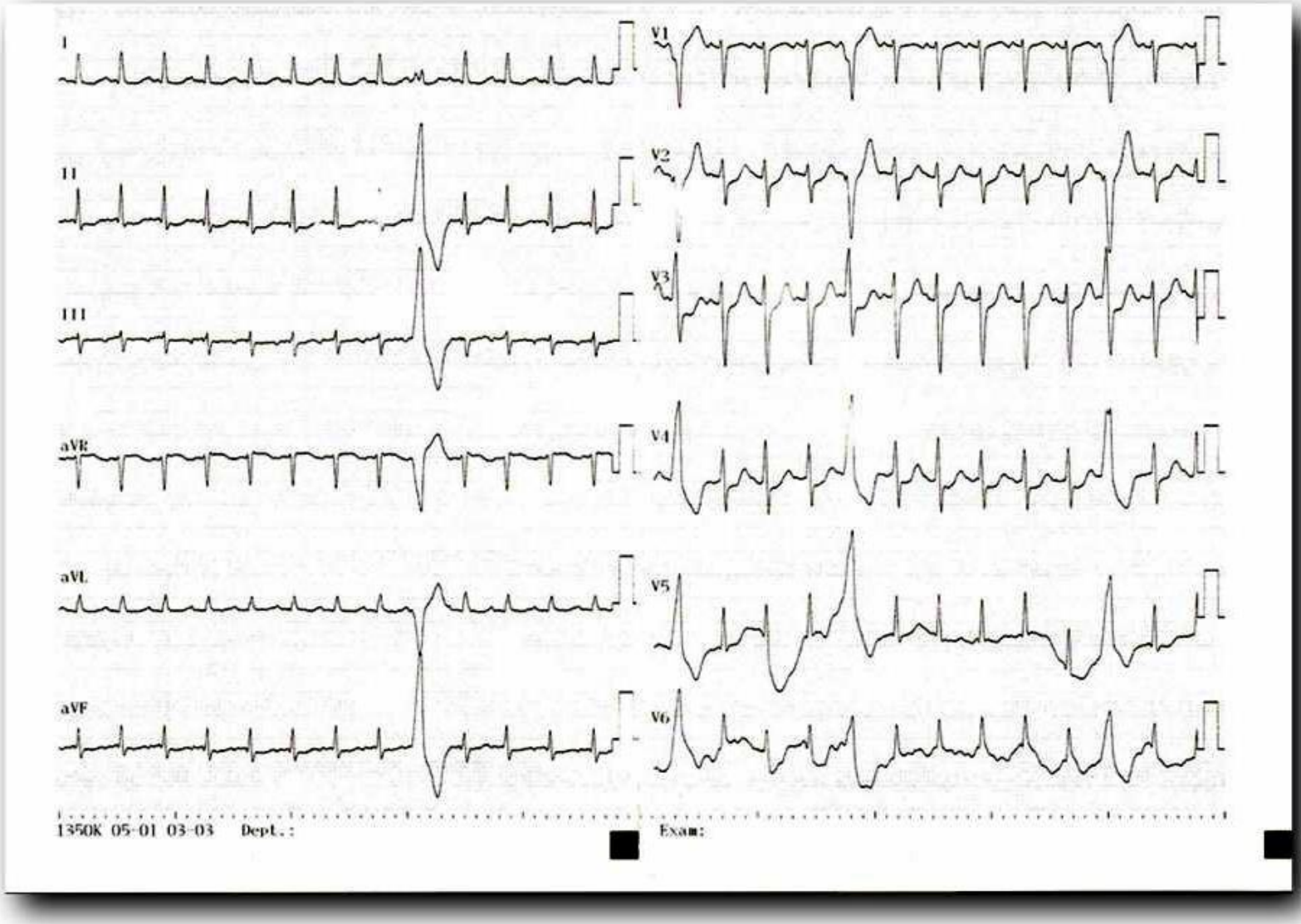
1. Double potanisyel
2. Fraksiyone geç potansiyeller
3. Diastolik potansiyeller

- Anatomik bölgeleri işaretle

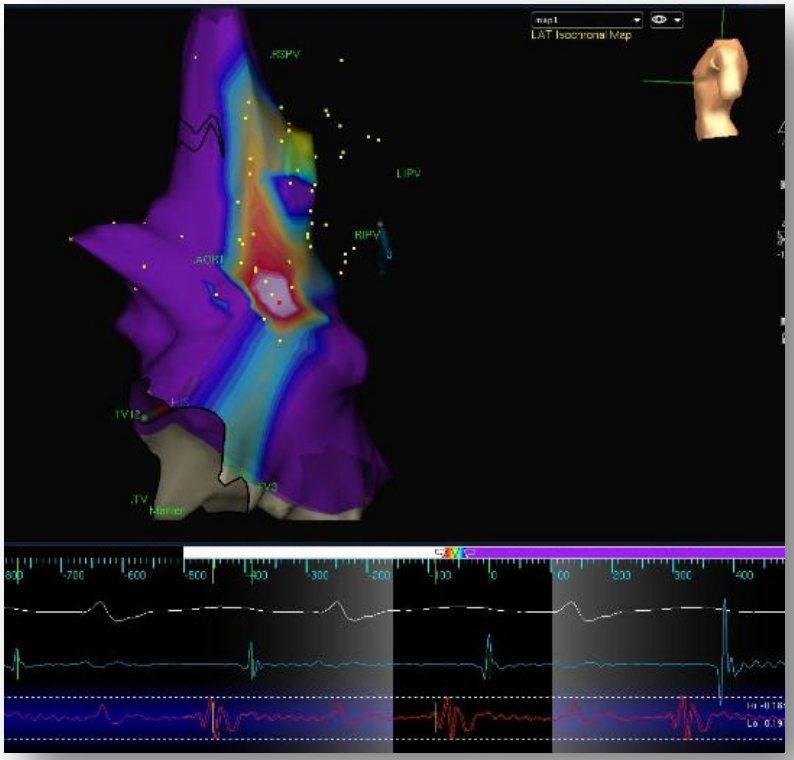
1. Triküspit-mitral anülüs
2. His
3. Cs
4. Vcs vci pulmoner venler vb

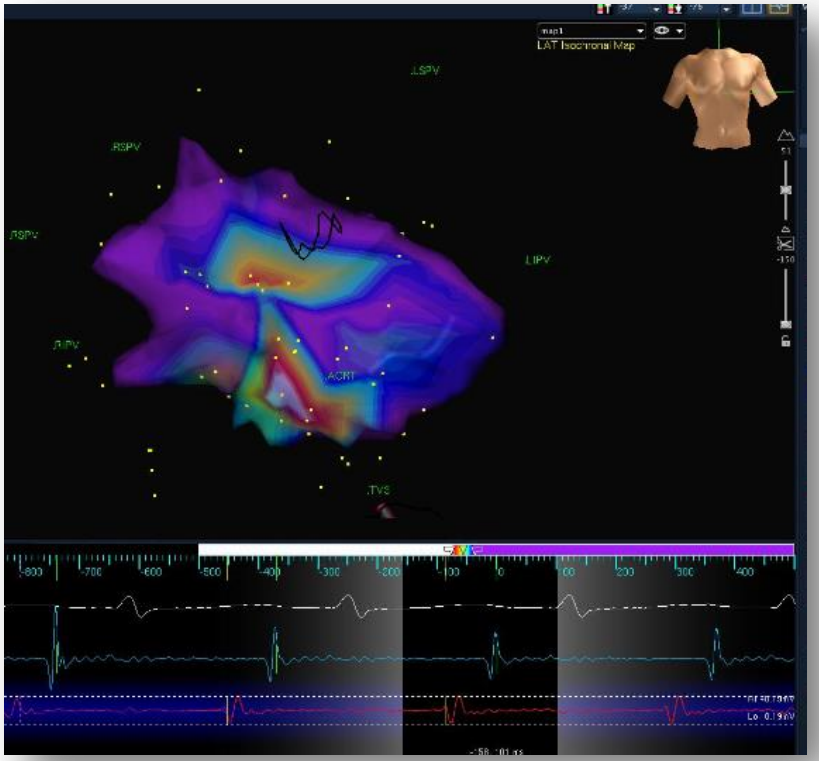
Taşikardi fokal mi reentry mi?

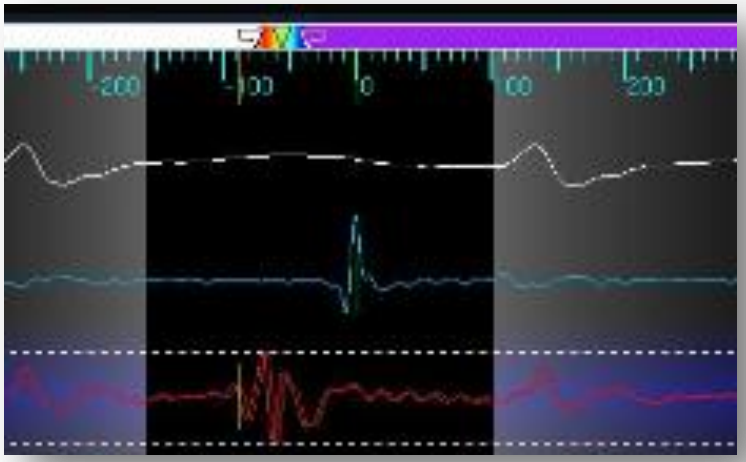
- Taşikardi aktivasyonu(en erken en geç yer arası süre)/taşikardi siklus uzunluğu
- Entrainment manevraları
- Adenozin
- 3D Mapping



45 Y KADIN, 1 yıldan beri son aylarda ayda 4-5 kere beta bloker ve propafenon'a rağmen 20-30 dk süreli çarpıntı atakları,

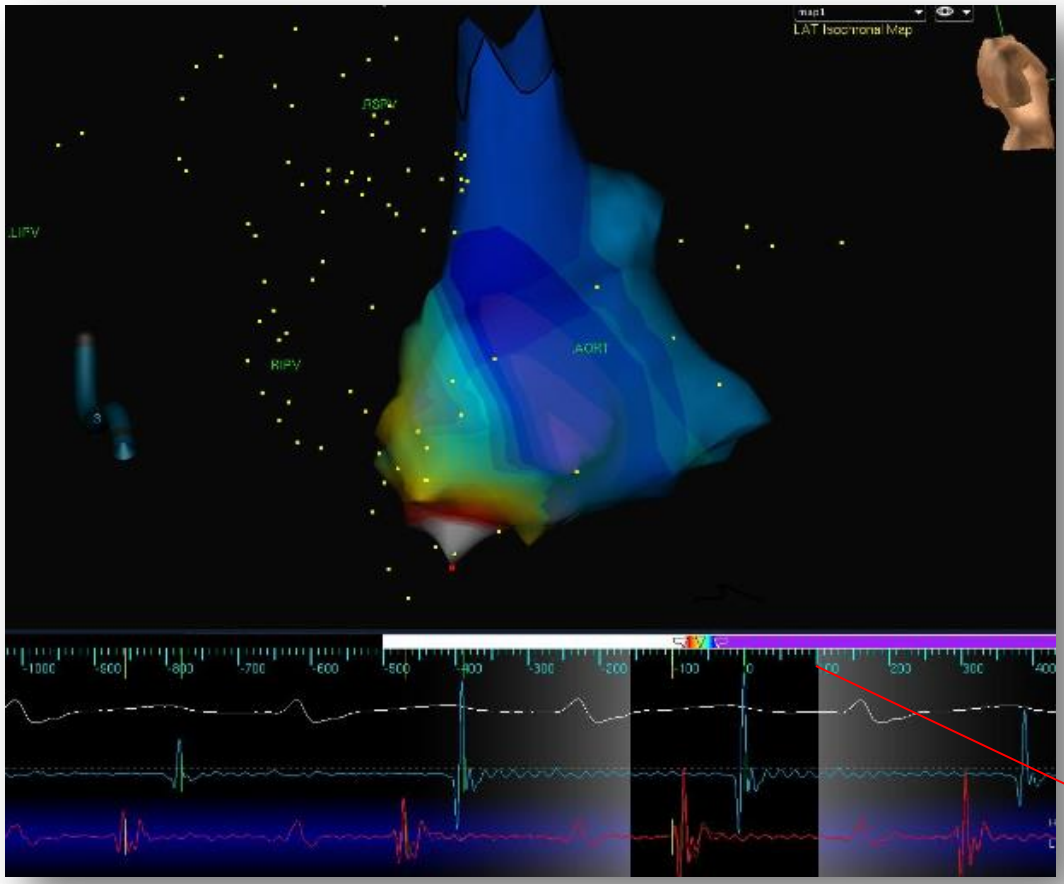


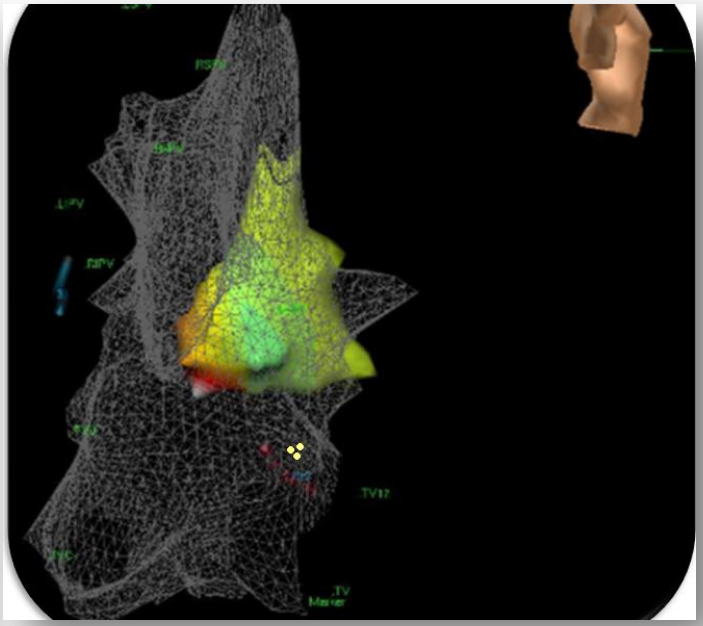




SAĞ ATRİYAL SEPTAL: Erken aktivasyon -47 ms

SOL ATRİYAL SEPTAL: Erken aktivasyon -45 ms





Başarılı Ablasyon yeri

Aort- Non koroner kapak

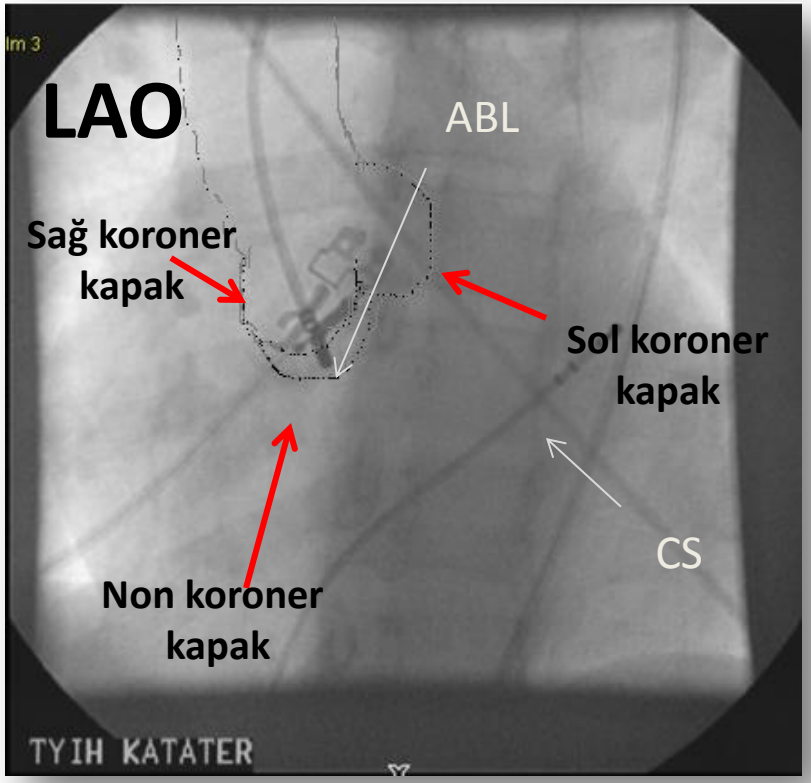
En erken aktivasyon: -61 ms,

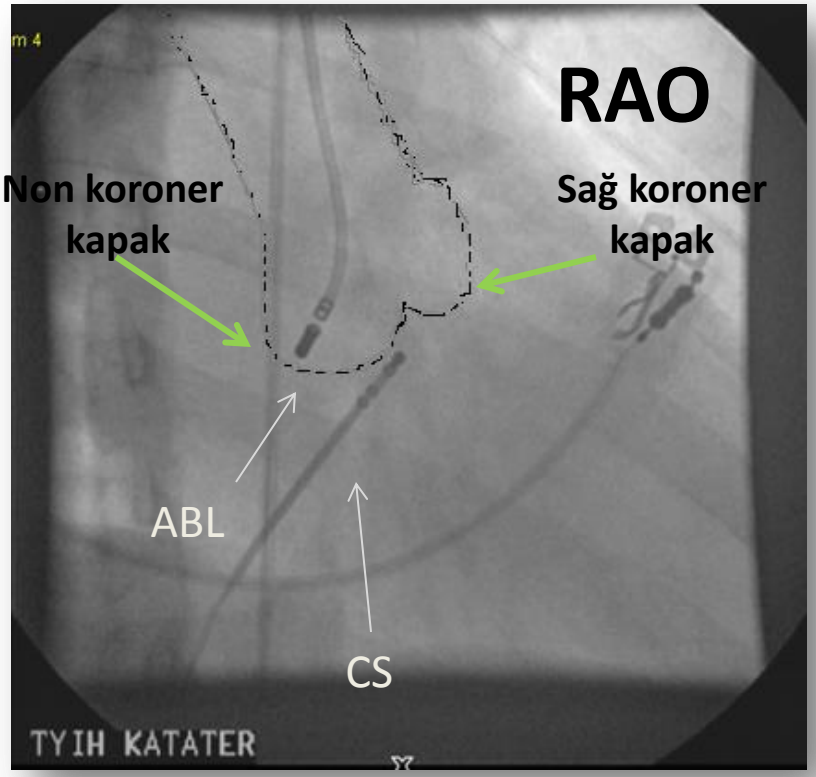
A kaydı yüksek voltajlı ve fragmente,

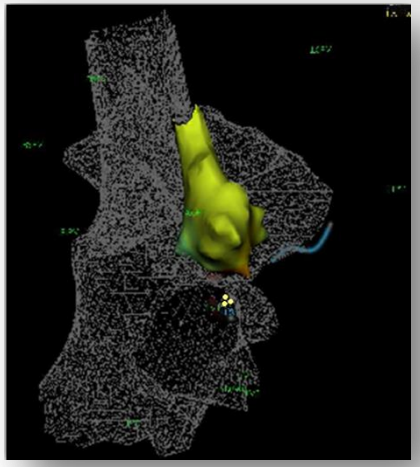
A>V

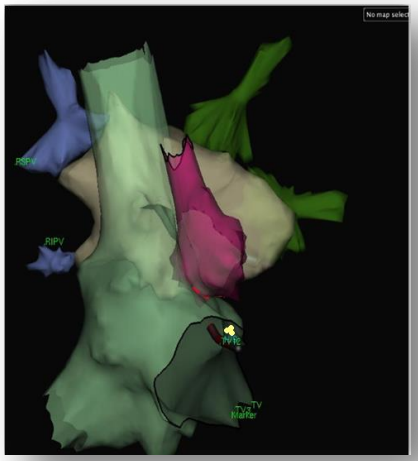
4 mm irrigasyon uçlu abl kateteri- 25 W-30 sn

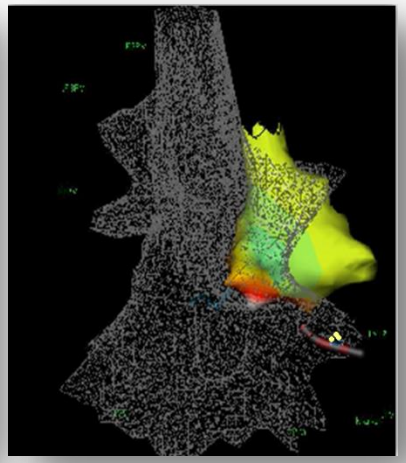
RF uygulamasının 3. sn'de takikardi sonlandı

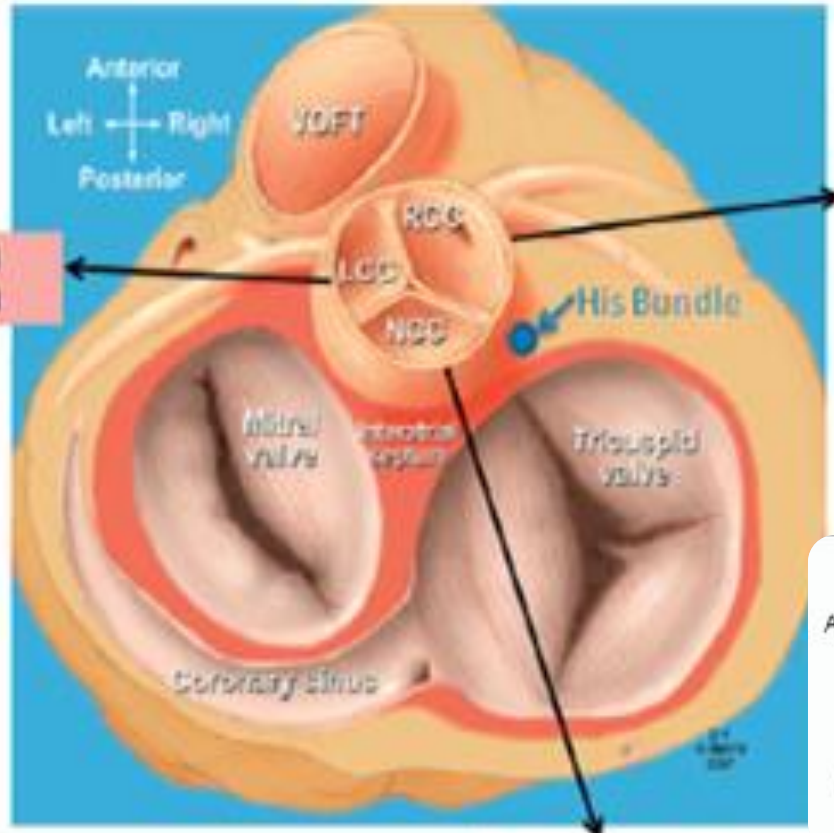

LAO
ABL
Sağ koroner kapak
Sol koroner kapak
CS
Non koroner kapak
TYIH KATATER


RAO
Non koroner kapak
Sağ koroner kapak
ABL
CS
TYIH KATATER



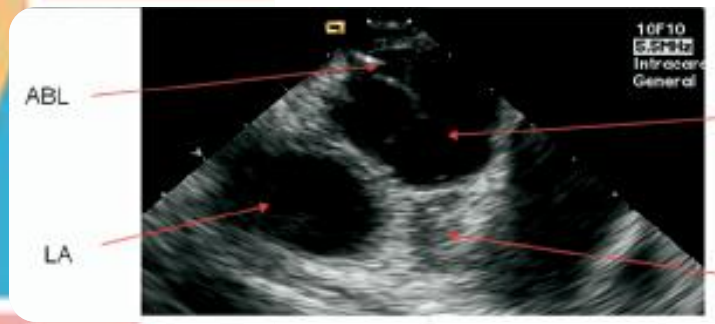




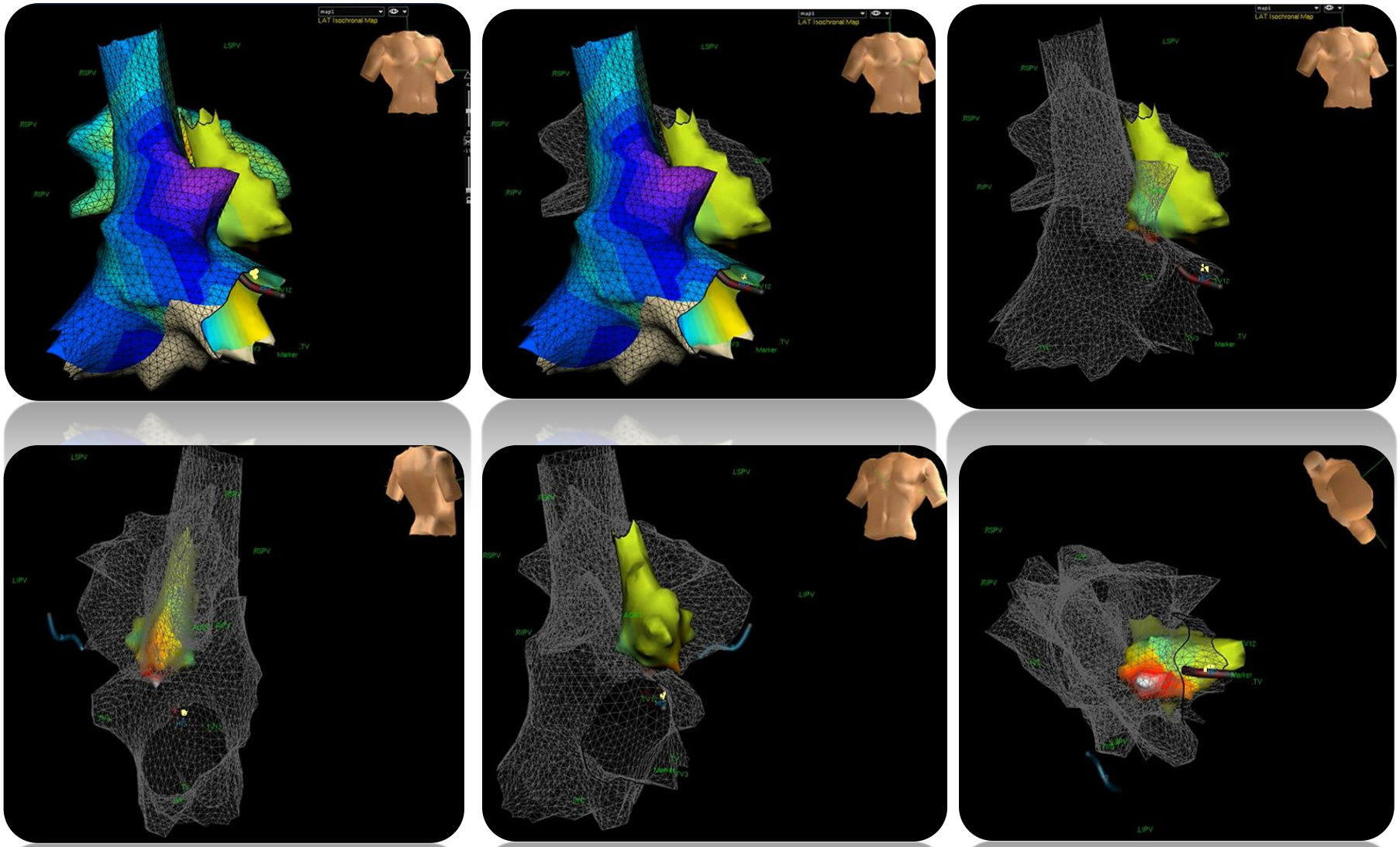


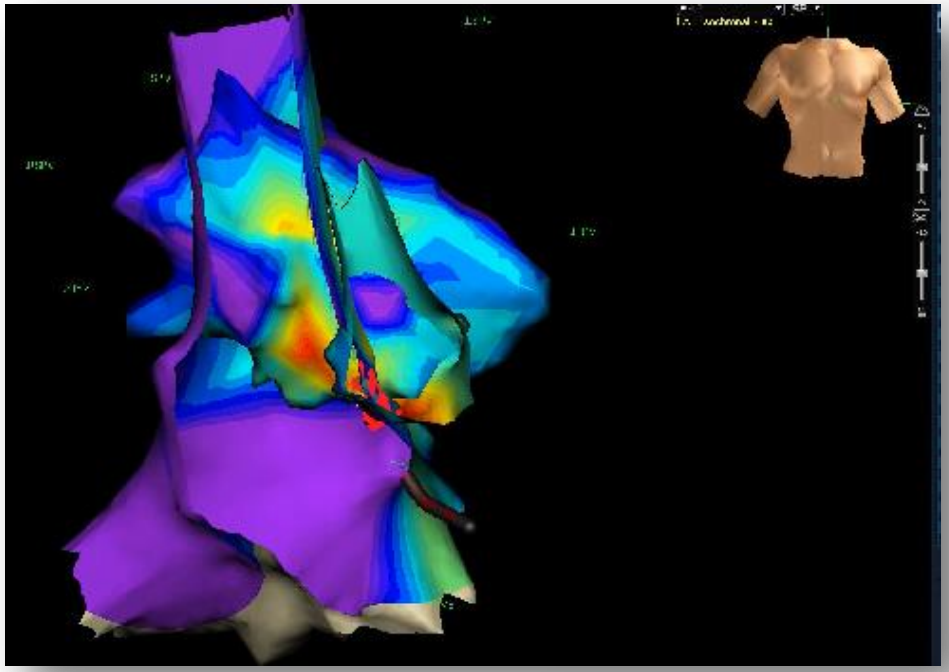
- Rarely VEGM
- Rarely AEGM

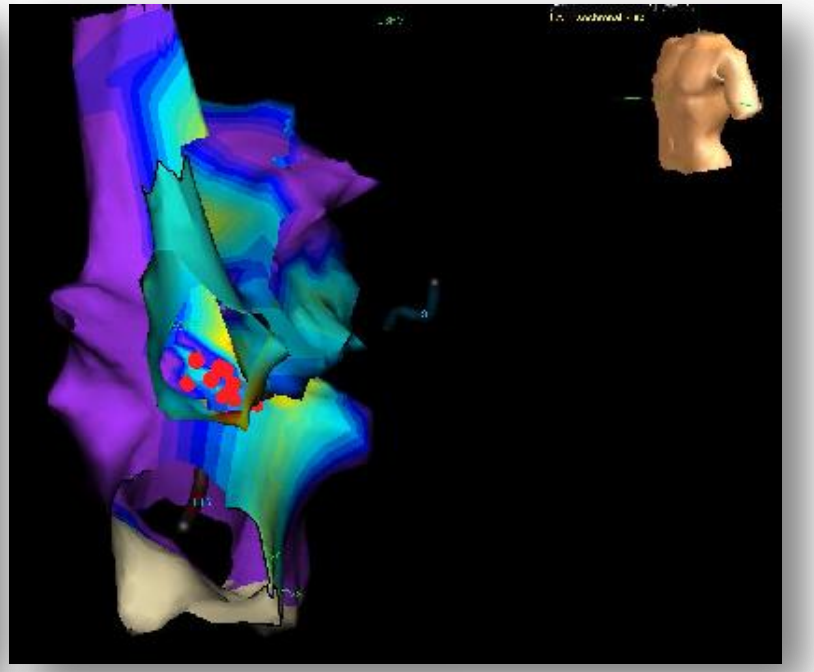
- VEGM in posterior cusp
- AEGM from atrial septum/ SVC
- AEGM from RAA in anterior cusp
- His potential in posterior cusp

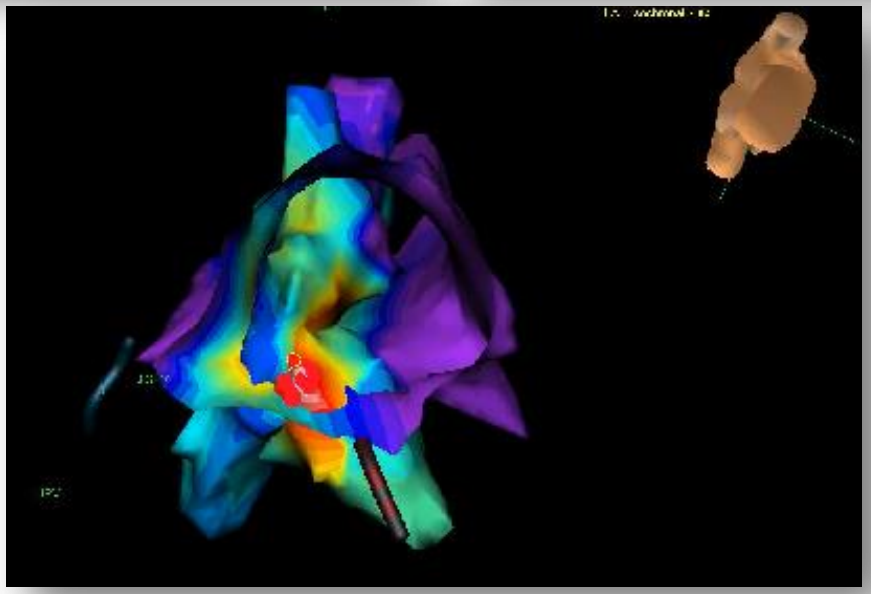


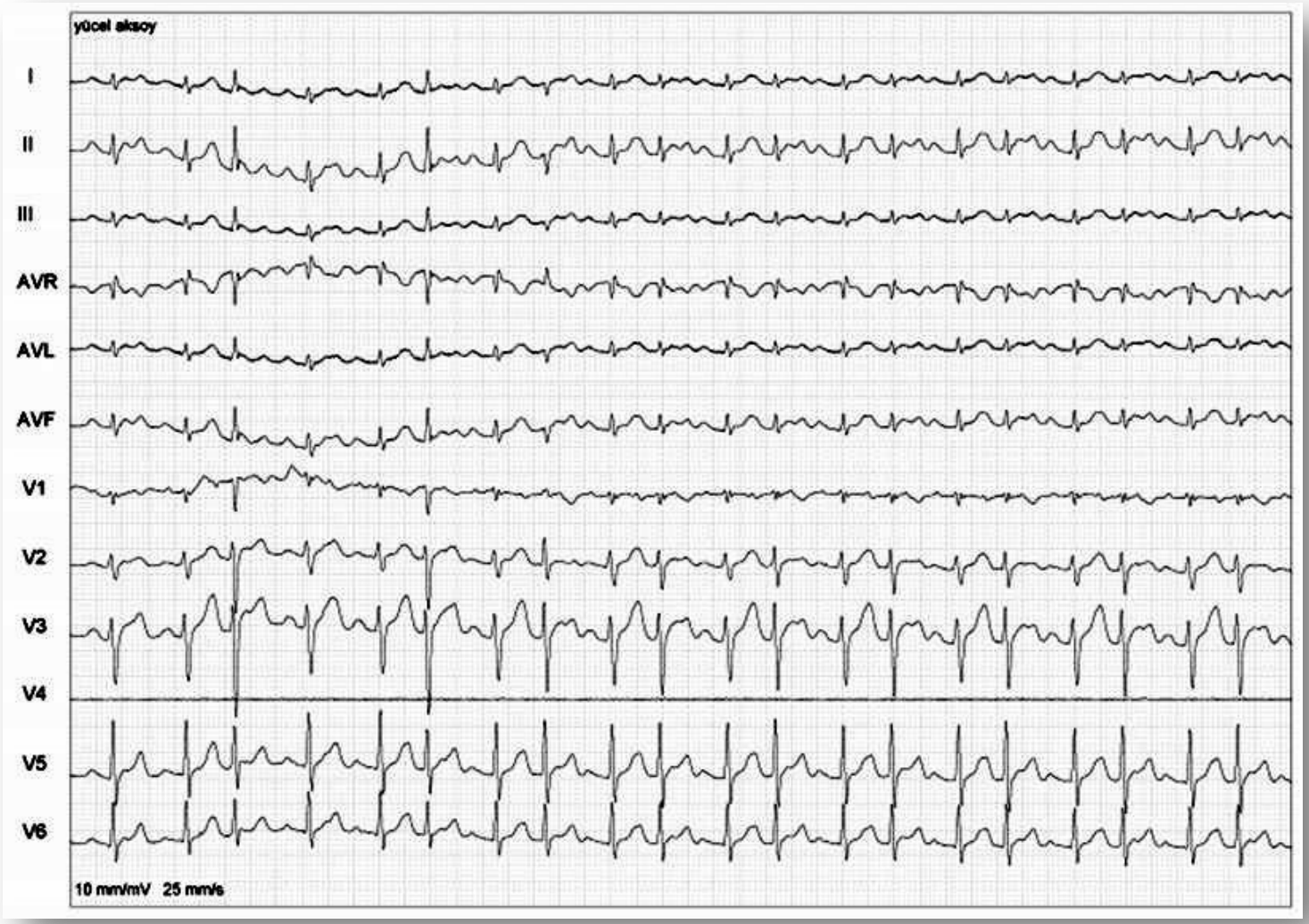
- AEGM from atrial septum
- Rarely VEGM
- Possibly His potential from anterior cusp


map1
LAT Isochronal Map
LSPV
RSPV
RIPV
LIPV
TV
Marker

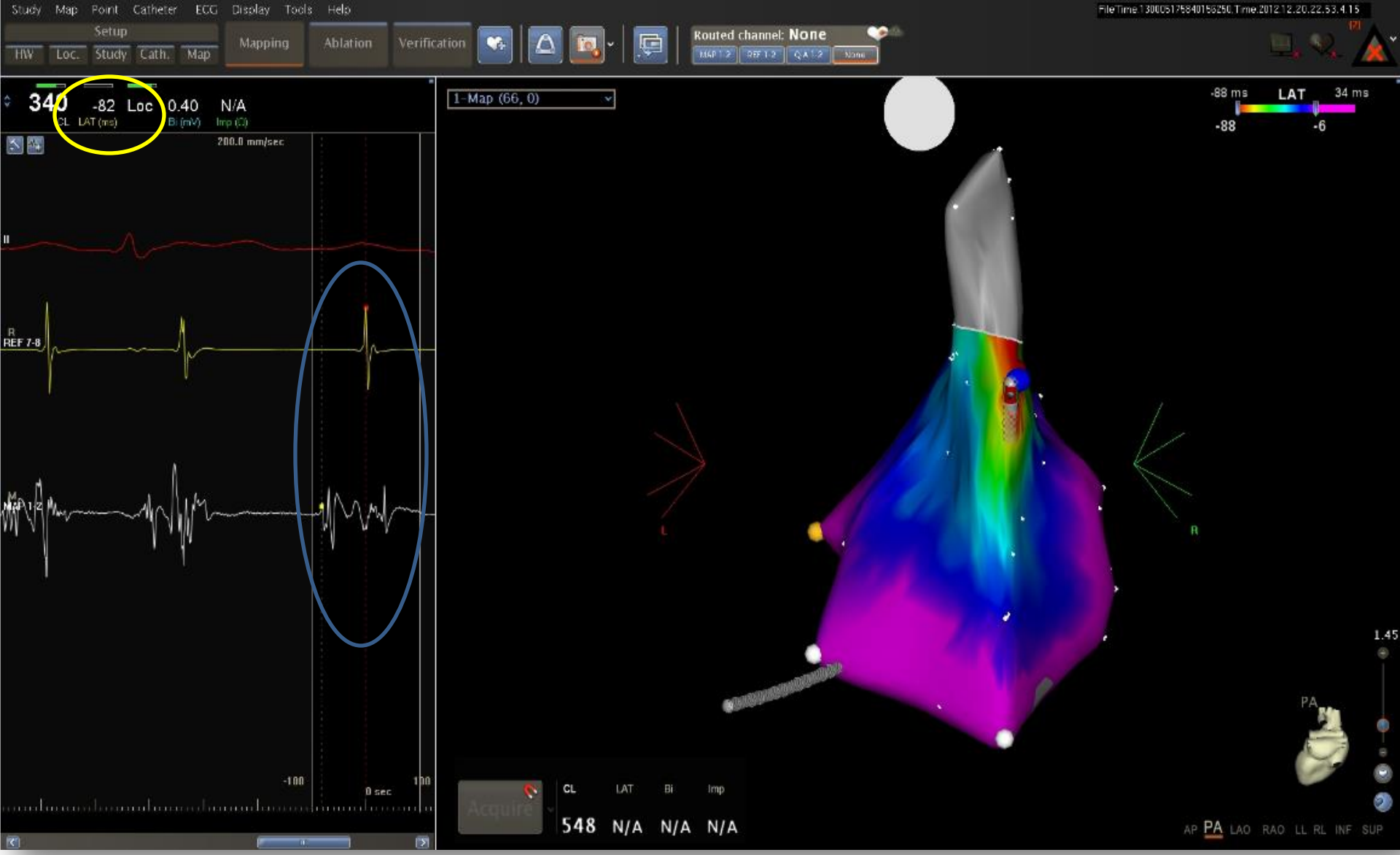




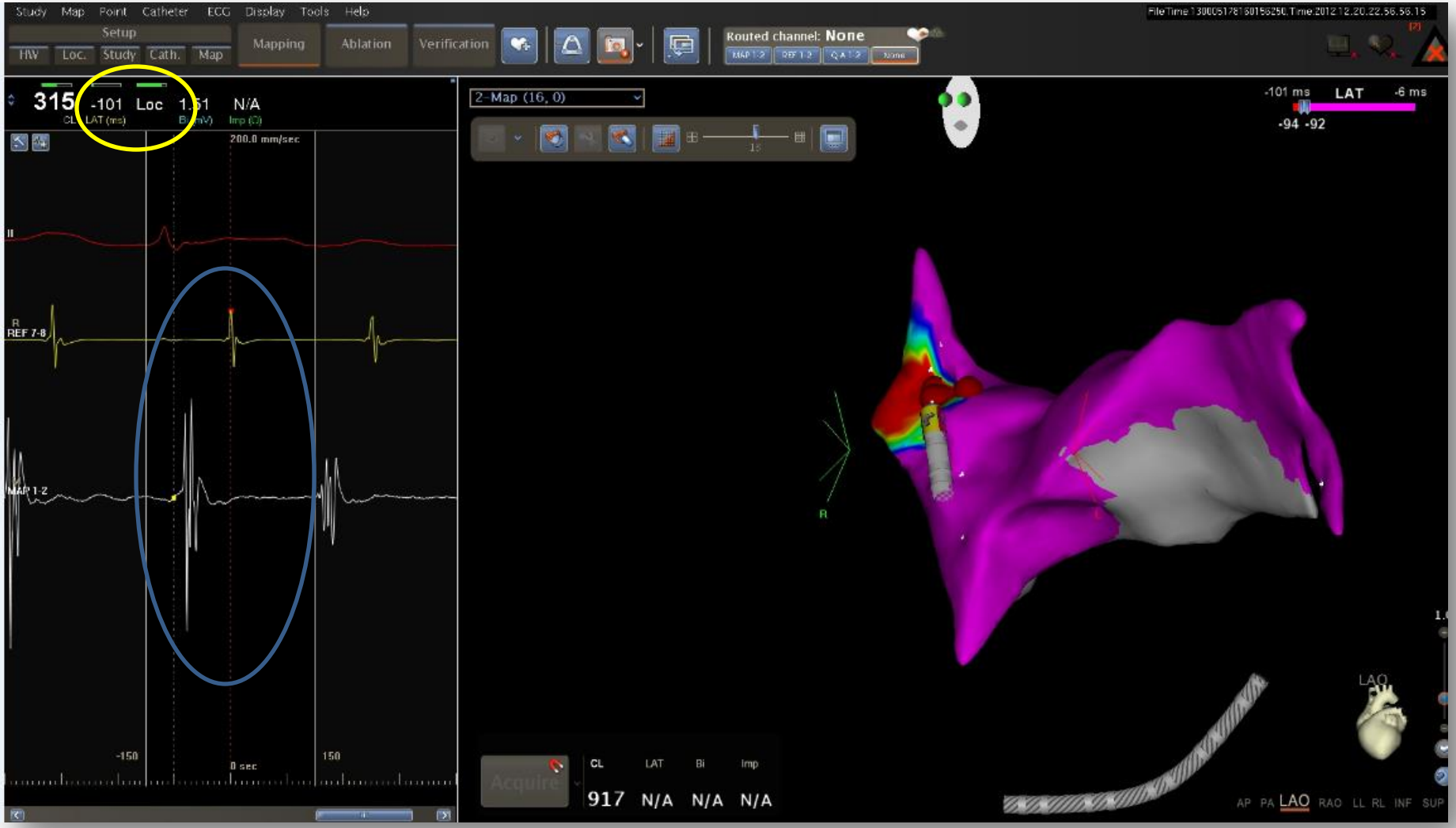




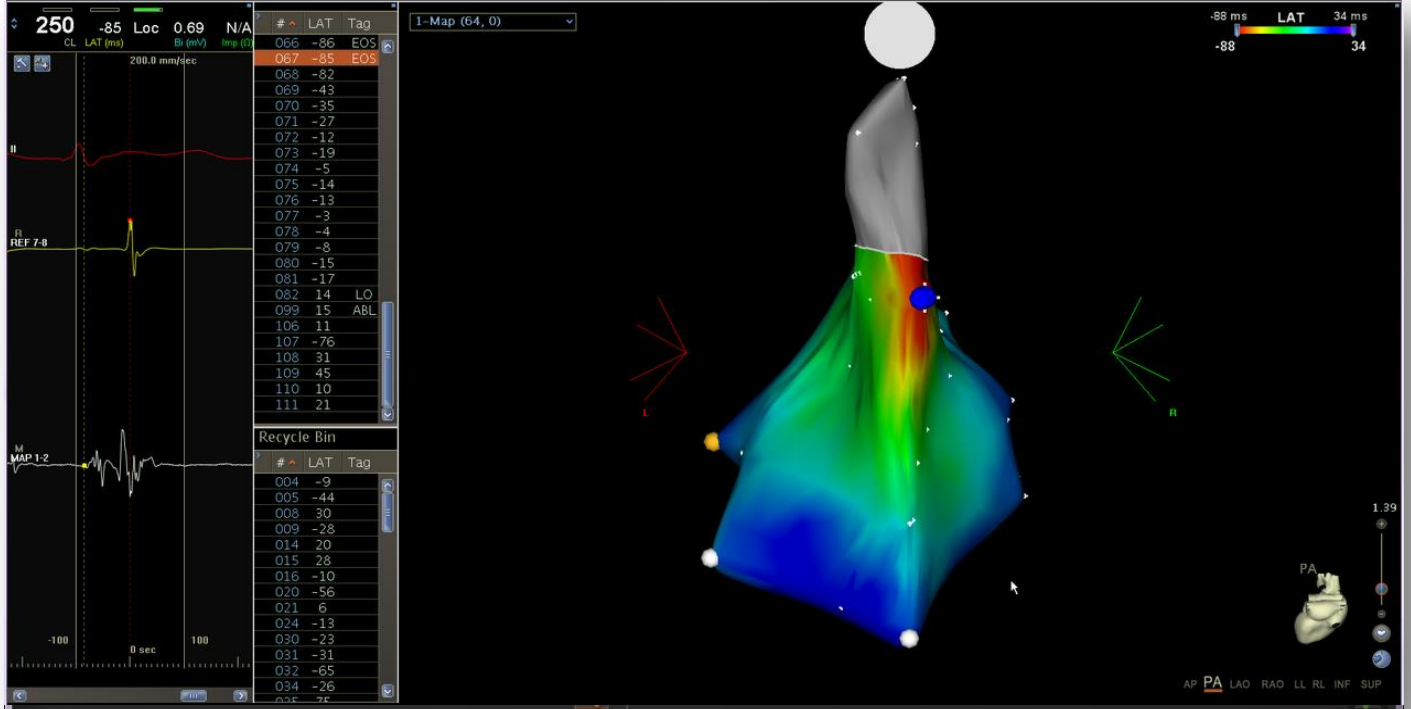
45 Y ERKEK, 2 yıldan beri ayda 3-4 kere 20-30- dk süreli takikardi atakları,
Diltiazem ve Propafenona yanıt yetersiz,
EKO: Normal,
1 kere sağ atriyumdan başarısız ablasyon girişimi var (atriyal takikardi?)

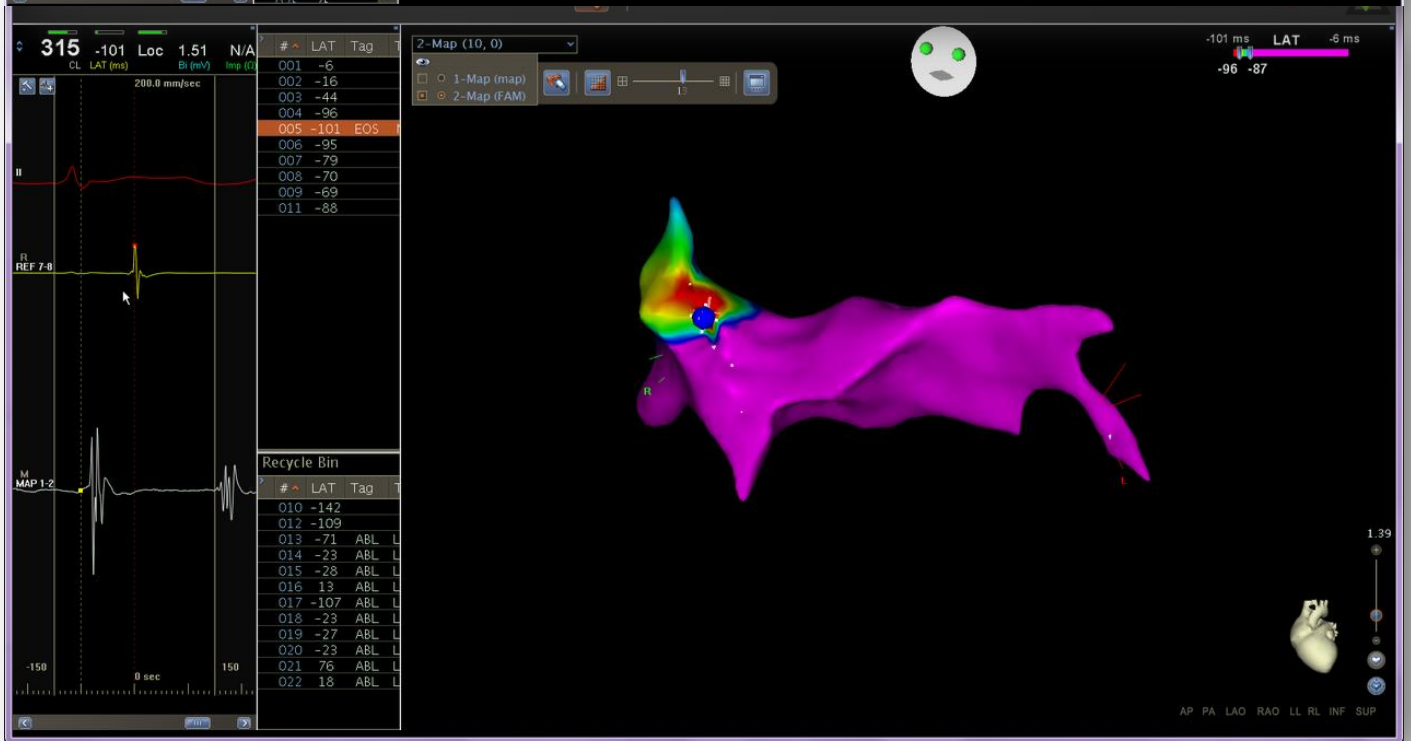


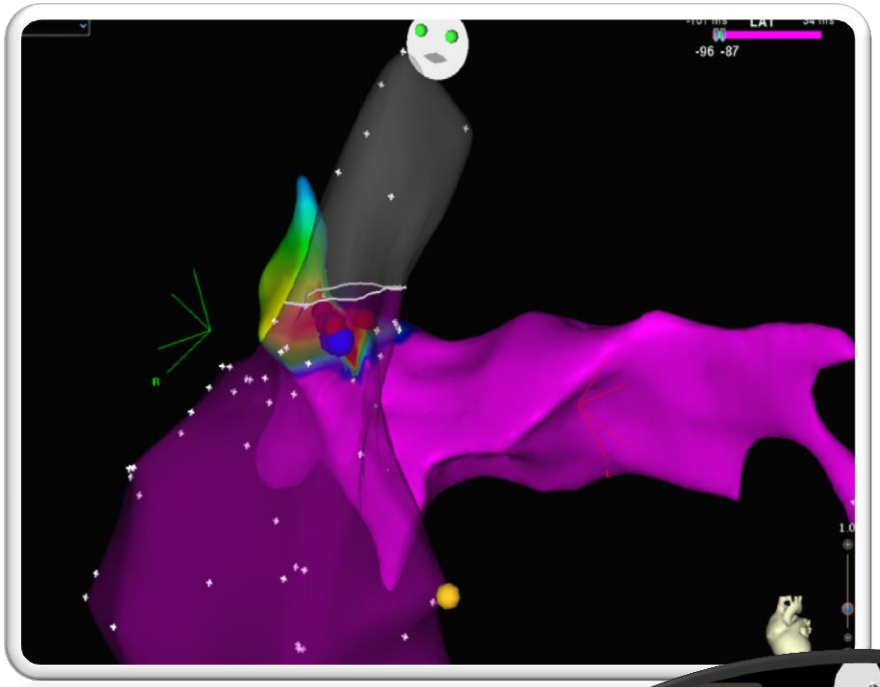
Carto-Electroanatomik haritalama- Sağ atriyum

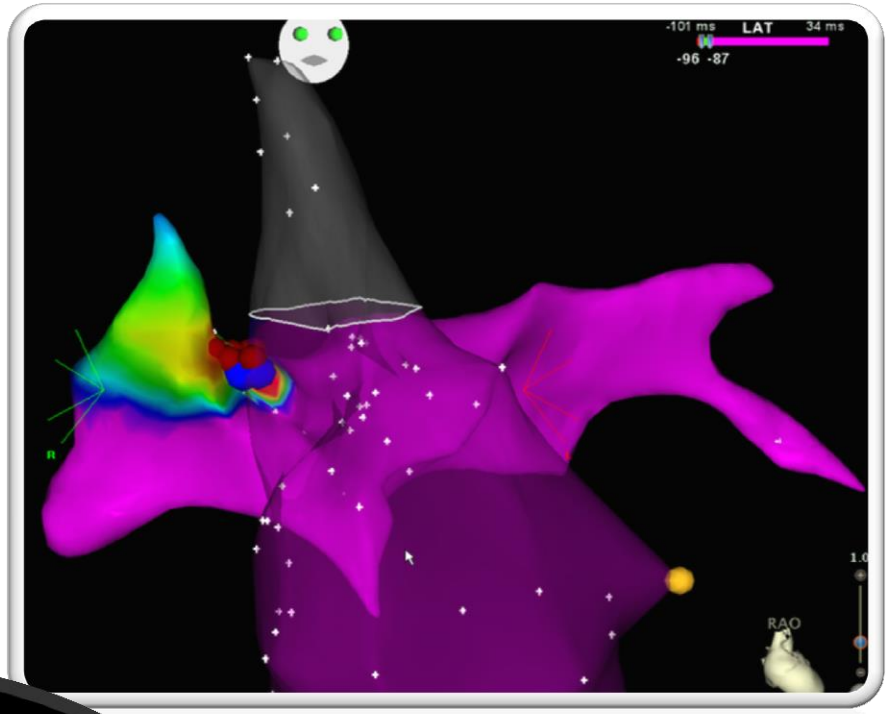


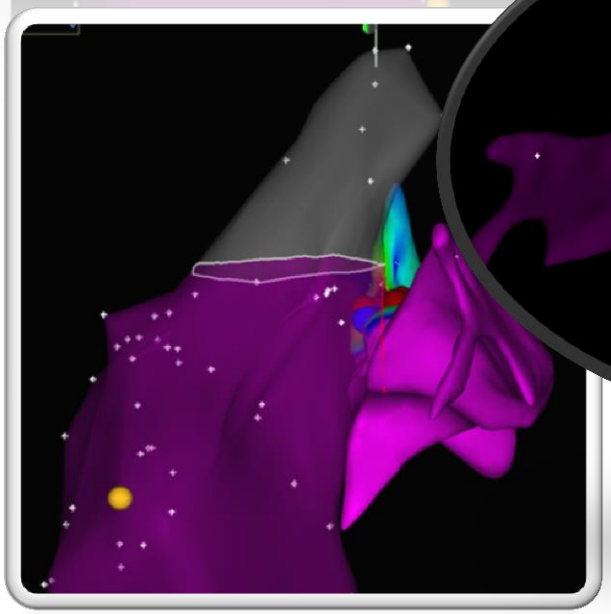
Carto-Electroanatomik haritalama- Sol atriyum
Sağ üst pulmoner ven

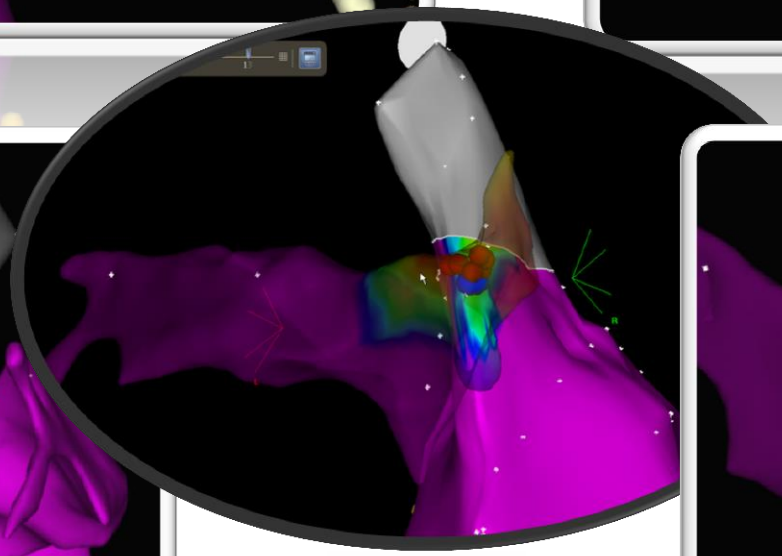

250
-85
CL
LAT (ms)
Loc
0.69
Bi (mV)
N/A
200.0 mm/sec
II
R
REF 7-8
M
MAP 1-2
-100
0 sec
100
LAT Tag
066 -86 EOS
067 -85 EOS
068 -82
069 -43
070 -35
071 -27
072 -12
073 -19
074 -5
075 -14
076 -13
077 -3
078 -4
079 -8
080 -15
081 -17
082 14 LO
099 15 ABL
106 11
107 -76
108 31
109 45
110 10
111 21
Recycle Bin
LAT Tag
004 -9
005 -44
008 30
009 -28
014 20
015 28
016 -10
020 -56
021 6
024 -13
030 -23
031 -31
032 -65
034 -26
1-Map (64, 0)
-88 ms
LAT
34 ms
-88
34
L
R
1.39
PA
AP PA LAO RAO LL RL INF SUP

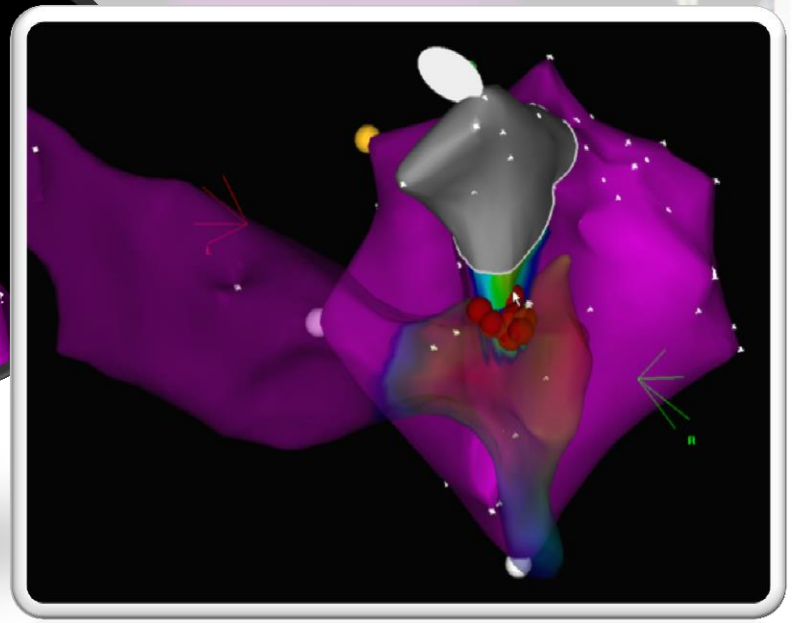

315
-101
CL
LAT (ms)
Loc
1.51
Bi (mV)
N/A
200.0 mm/sec
II
R
REF 7-8
M
MAP 1-2
-150
0 sec
150
LAT Tag
001 -6
002 -16
003 -44
004 -96
005 -101 EOS
006 -95
007 -79
008 -70
009 -69
011 -88
Recycle Bin
LAT Tag
010 -142
012 -109
013 -71 ABL L
014 -23 ABL L
015 -28 ABL L
016 13 ABL L
017 -107 ABL L
018 -23 ABL L
019 -27 ABL L
020 -23 ABL L
021 76 ABL L
022 18 ABL L
2-Map (10, 0)
1-Map (map)
2-Map (FAM)
-101 ms
LAT
-6 ms
-96 -87
R
L
1.39
AP PA LAO RAO LL RL INF SUP

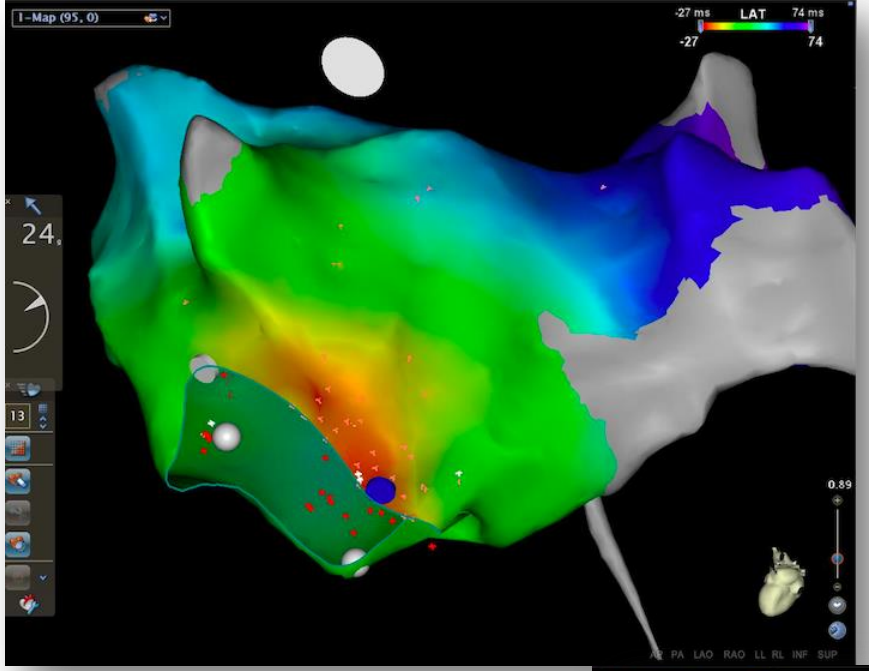

-101 ms
LAT
34 ms
-96 -87
R
1.0

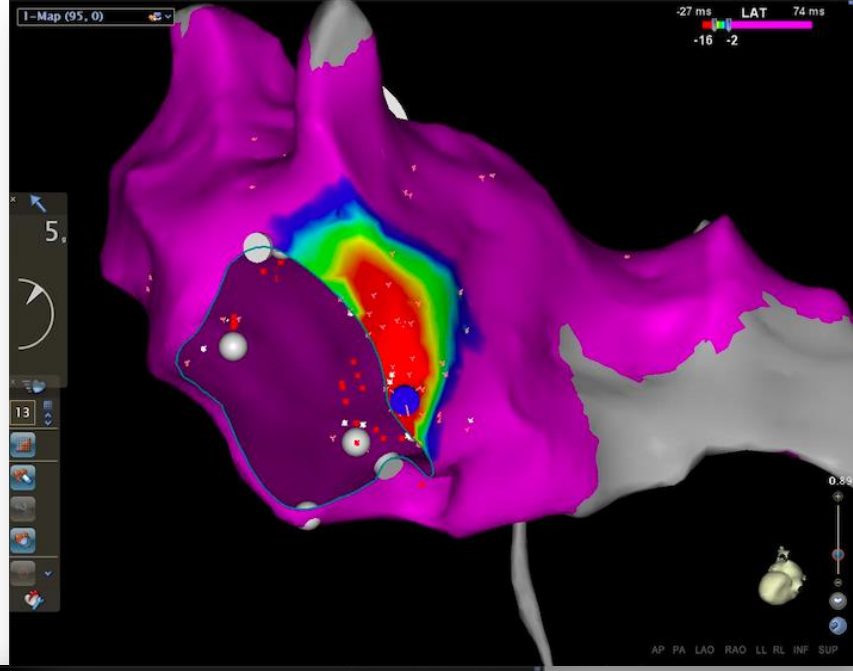

-101 ms
LAT
34 ms
-96 -87
R
1.0
RAO



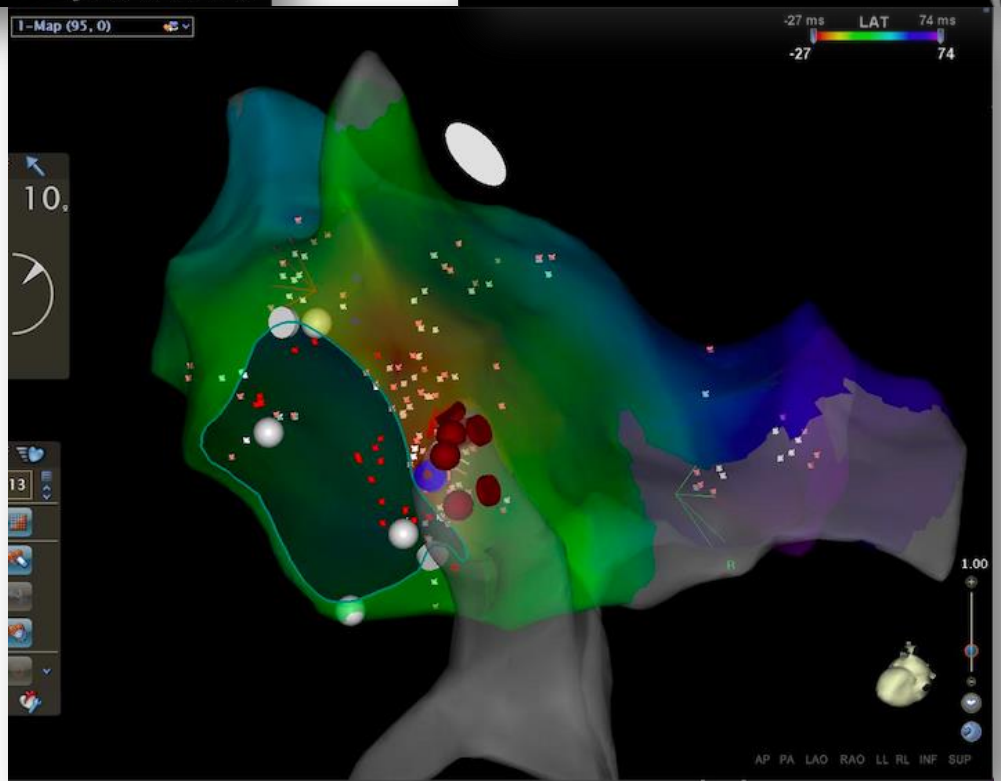



R





34 yaşında
kadın hasta



Reentry taşikardi doğru boşluk neresi?

- En erken aktivasyon-en geç aktivasyon/taşikardi siklus uzunluğu >%70-90

/ TCL

- Taşikardi siklus değişiklikleri
- Entrainment pacin PPI<30 msn (multipl alandan)

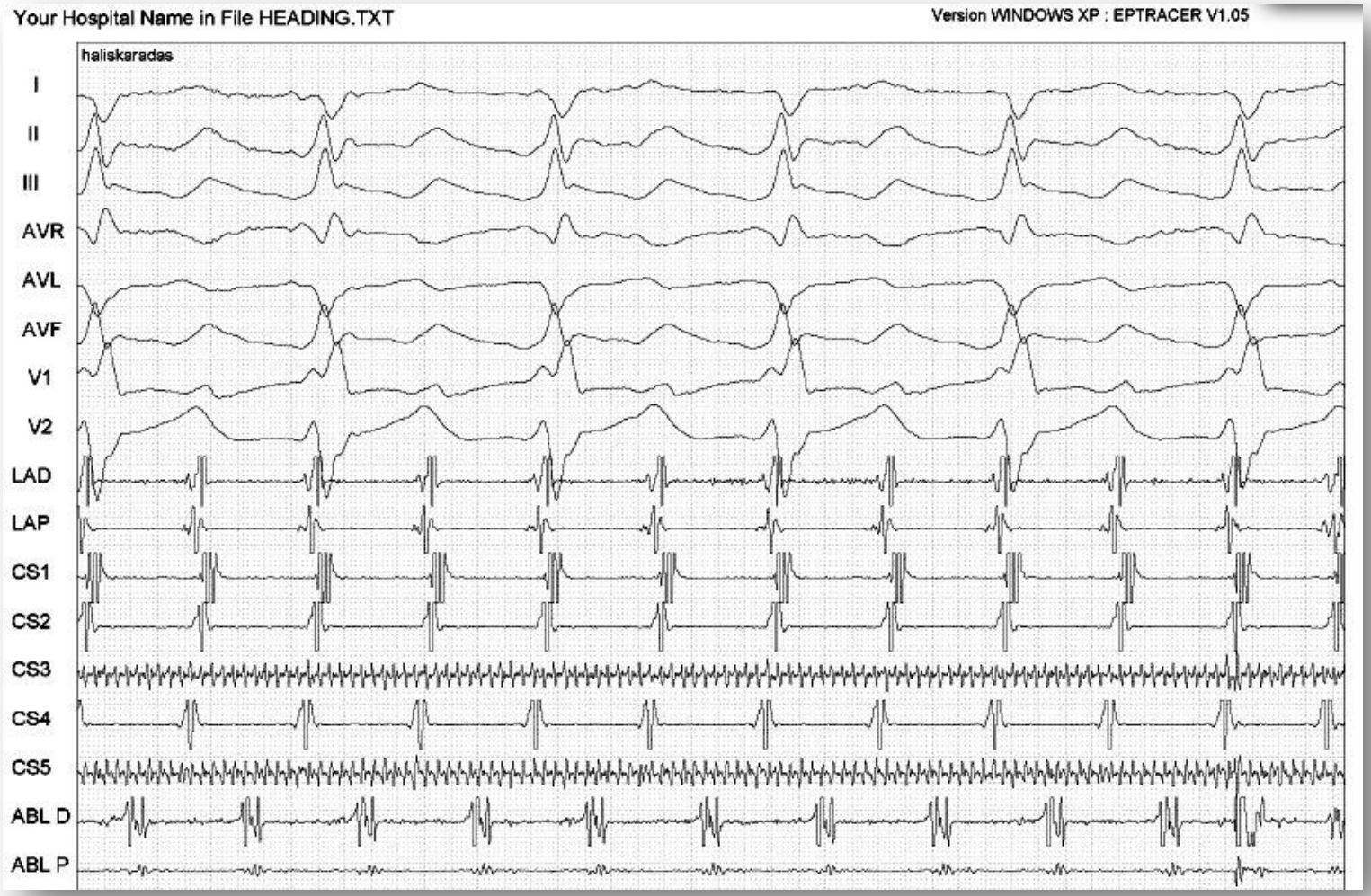
Reentry taşikardi doğru boşluk neresi?

- Cs aktivasyonu

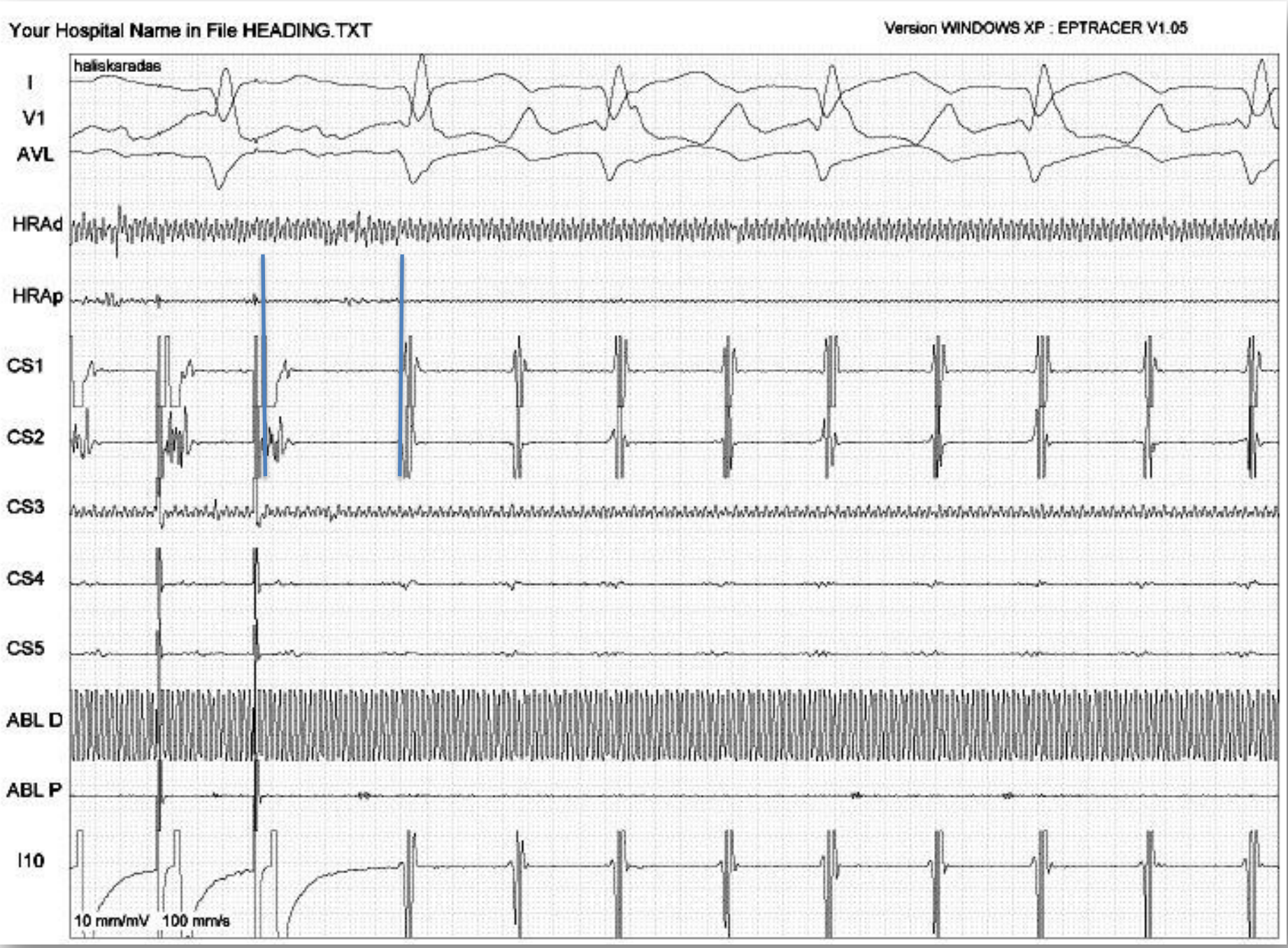
istisnalar

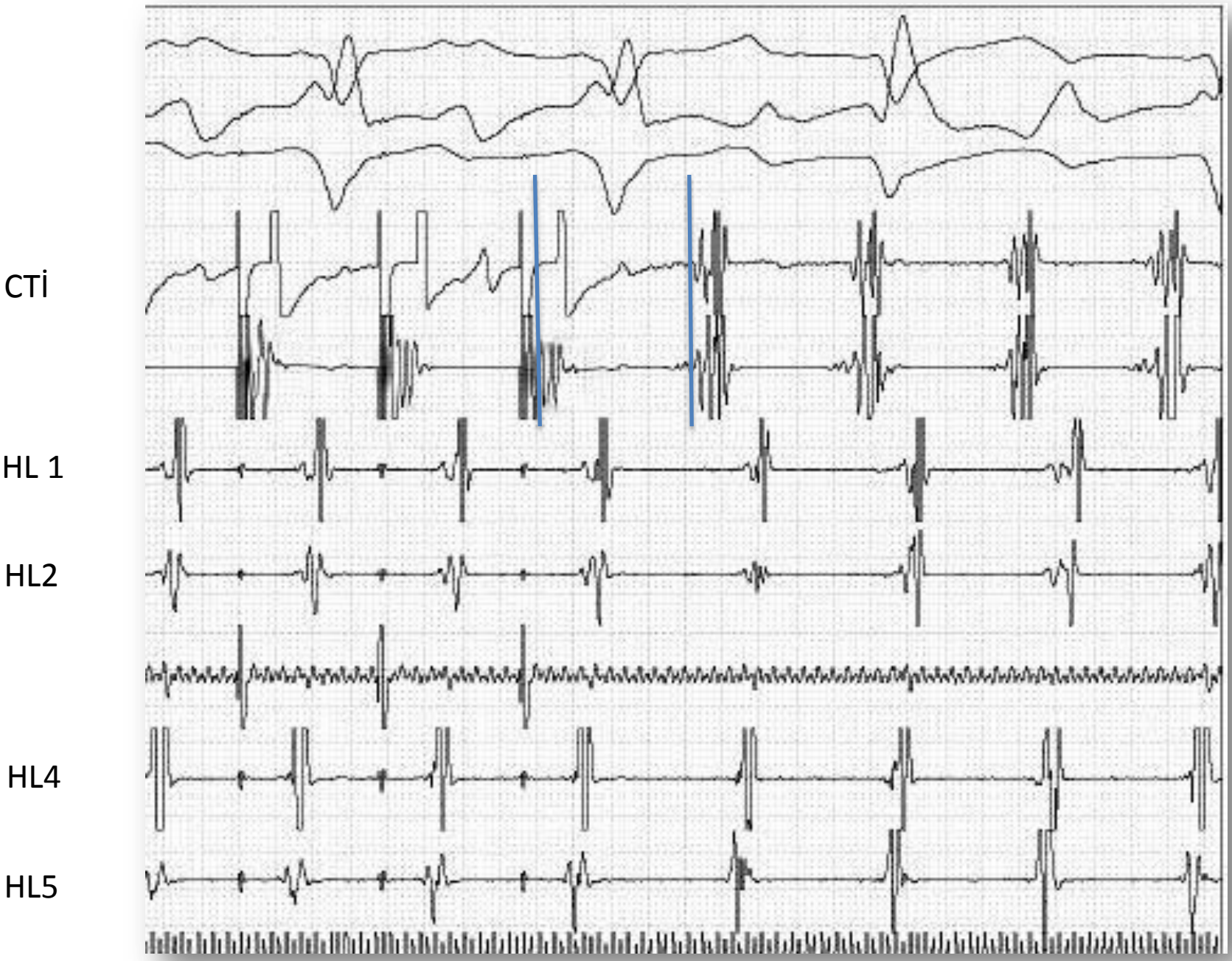
1. Sağ üst pulmoner ven, sol septal
2. Perimitral reentry (counter clockwise)
3. Bachman ile iletim,

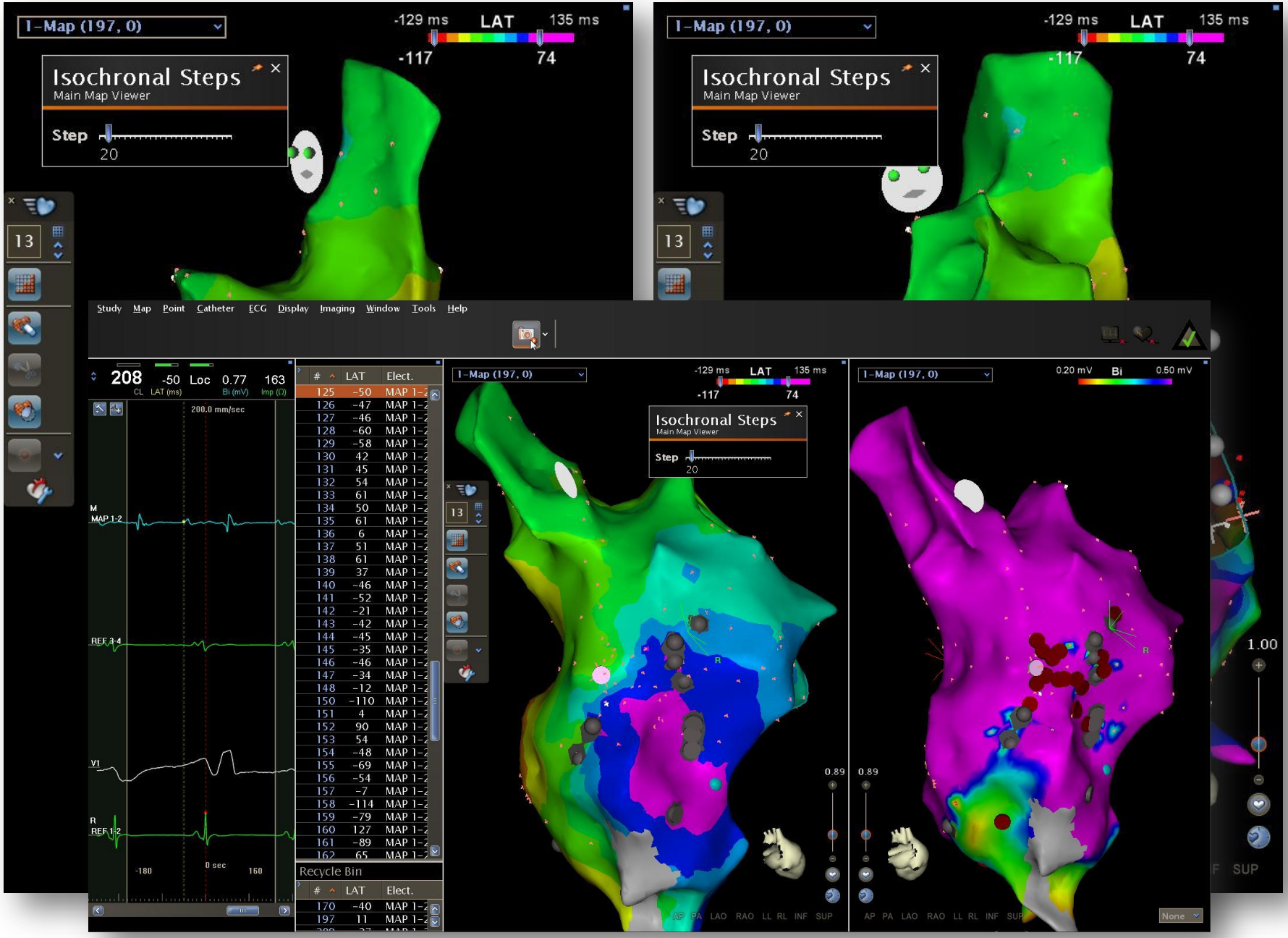
- Sol atriyumdaki taşikardi, sağ atriyumda tipik flutter gibi hareket edebilir.



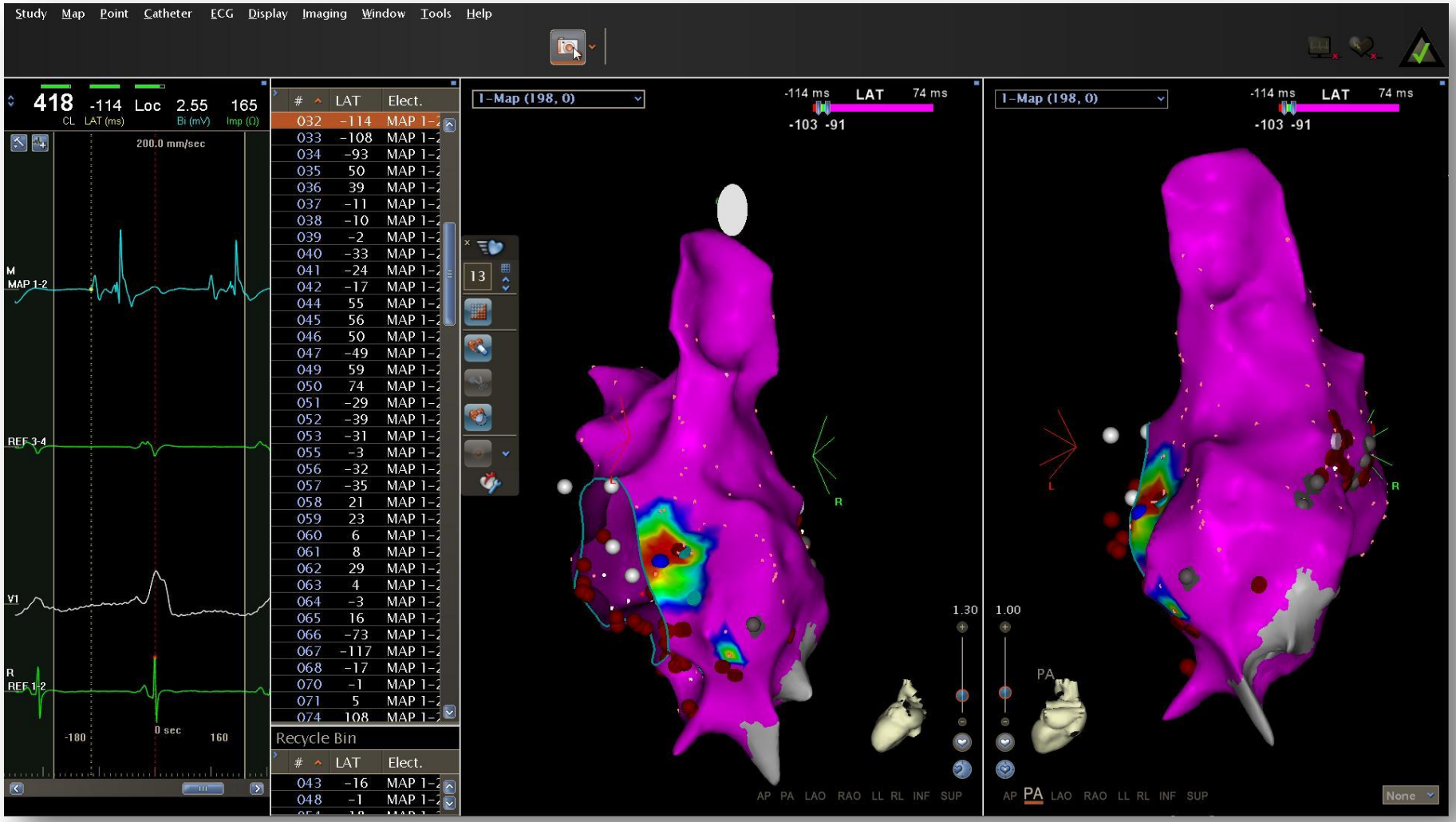
54 yaşında erkek hasta 14 yıl önce sekundum ASD nedeni ile opere olmuş, son bir aydır kesintisiz taşikardi atağı.

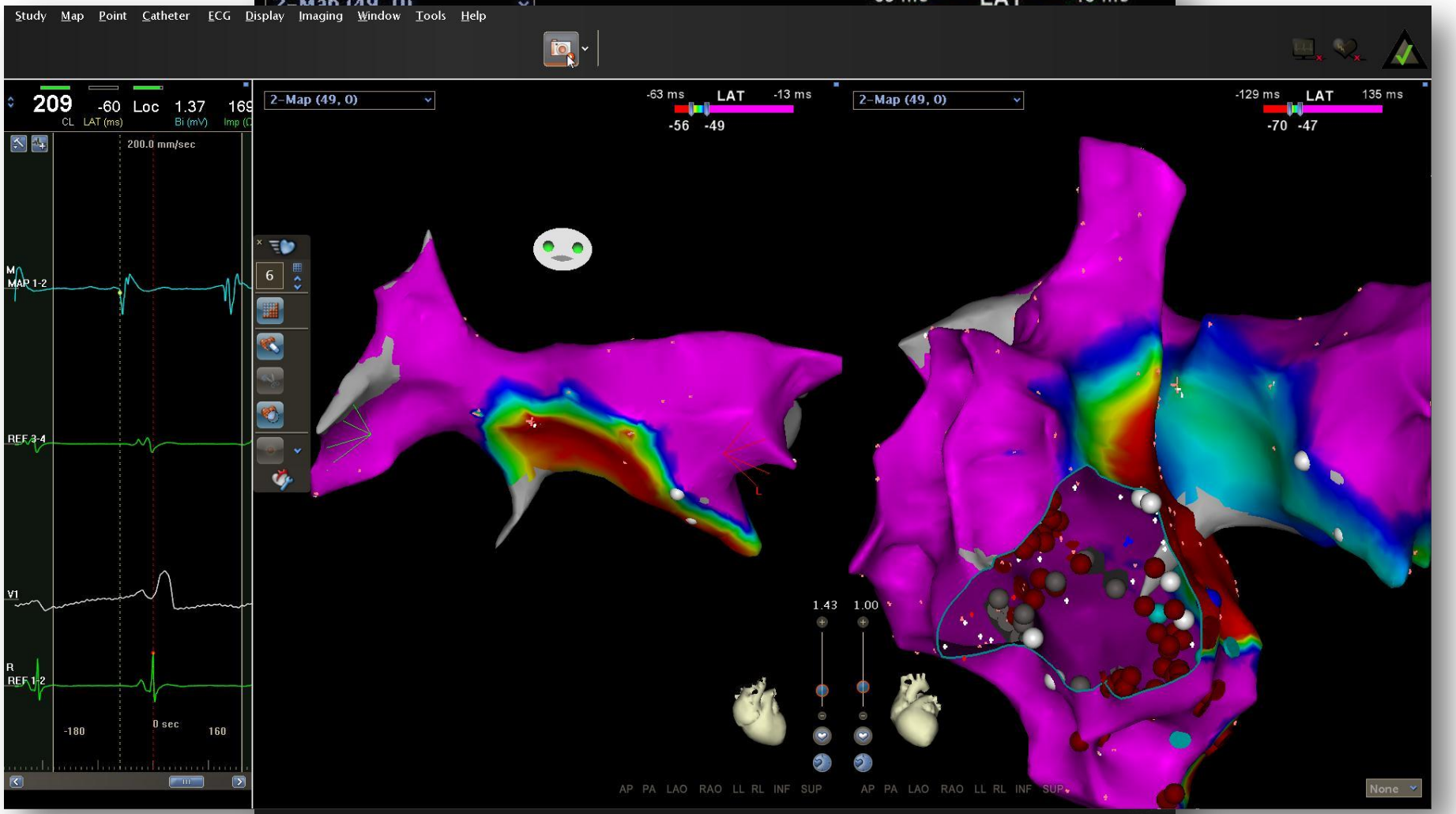

Your Hospital Name in File HEADING.TXT
Version WINDOWS XP : EPTRACER V1.05
haliskaradas
I
V1
AVL
HRAd
HRAp
CS1
CS2
CS3
CS4
CS5
ABL D
ABL P
I10
10 mm/mV
100 mm/s

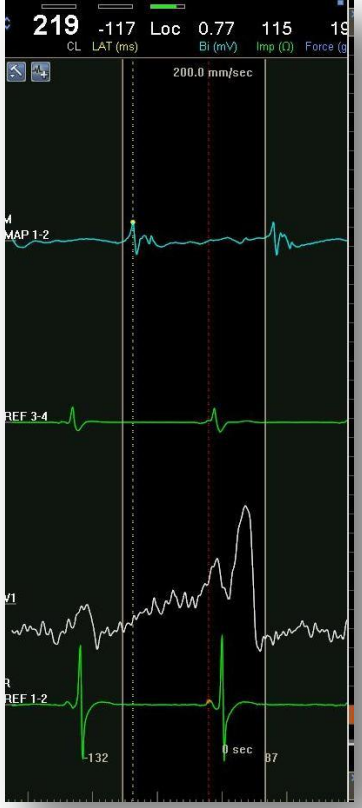

CTİ
HL 1
HL2
HL4
HL5

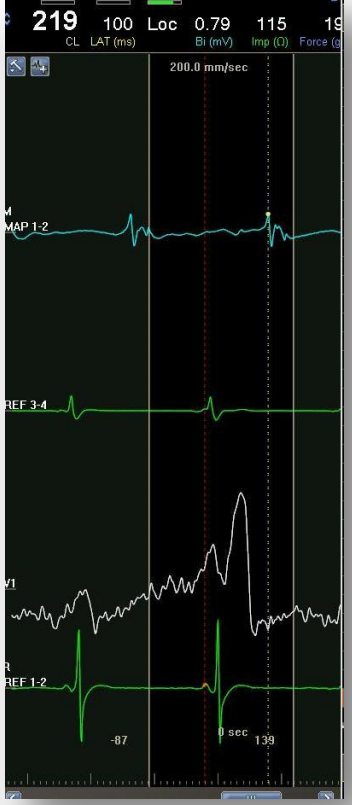

1-Map (197, 0)
-129 ms
LAT
135 ms
-117
74
Isochronal Steps
Main Map Viewer
Step
20
Study Map Point Catheter ECG Display Imaging Window Tools Help
208
CL
-50
LAT (ms)
Loc
0.77
Bi (mV)
163
Imp (Ω)
200.0 mm/sec
MAP 1-2
REF 3-4
V1
REF 1-2
-180
0 sec
160
LAT Elect.
Recycle Bin
0.20 mV
Bi
0.50 mV
0.89
AP PA LAO RAO LL RL INF SUP
None
1.00

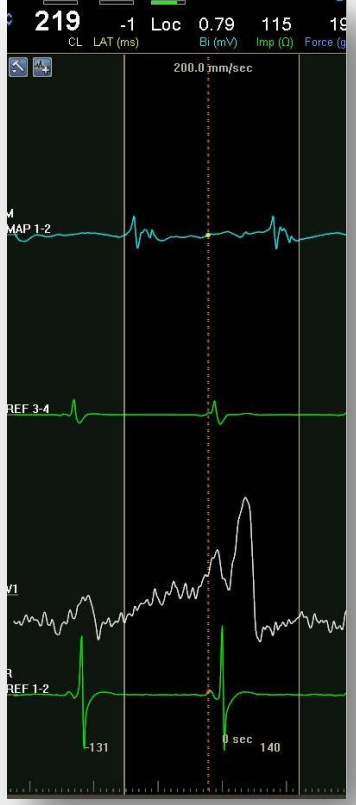
Kırmızı gerçekten erken mi demek ?

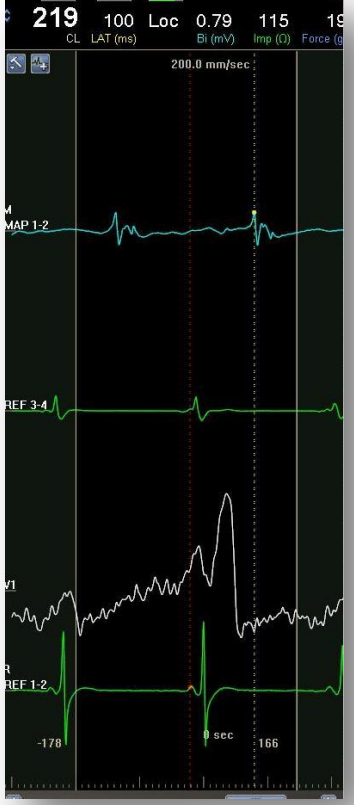

Study Map Point Catheter ECG Display Imaging Window Tools Help
418 -114 Loc 2.55 165
CL LAT (ms) Bi (mV) Imp (Ω)
200.0 mm/sec
M
MAP 1-2
REF 3-4
V1
R
REF 1-2
-180
0 sec
160
LAT Elect.
032 -114 MAP 1-2
033 -108 MAP 1-2
034 -93 MAP 1-2
035 50 MAP 1-2
036 39 MAP 1-2
037 -11 MAP 1-2
038 -10 MAP 1-2
039 -2 MAP 1-2
040 -33 MAP 1-2
041 -24 MAP 1-2
042 -17 MAP 1-2
044 55 MAP 1-2
045 56 MAP 1-2
046 50 MAP 1-2
047 -49 MAP 1-2
049 59 MAP 1-2
050 74 MAP 1-2
051 -29 MAP 1-2
052 -39 MAP 1-2
053 -31 MAP 1-2
055 -3 MAP 1-2
056 -32 MAP 1-2
057 -35 MAP 1-2
058 21 MAP 1-2
059 23 MAP 1-2
060 6 MAP 1-2
061 8 MAP 1-2
062 29 MAP 1-2
063 4 MAP 1-2
064 -3 MAP 1-2
065 16 MAP 1-2
066 -73 MAP 1-2
067 -117 MAP 1-2
068 -17 MAP 1-2
070 -1 MAP 1-2
071 5 MAP 1-2
074 108 MAP 1-2
Recycle Bin
LAT Elect.
043 -16 MAP 1-2
048 -1 MAP 1-2
1-Map (198, 0)
-114 ms LAT 74 ms
-103 -91
13
R
1.30
AP PA LAO RAO LL RL INF SUP
1-Map (198, 0)
-114 ms LAT 74 ms
-103 -91
L
R
1.00
PA
AP PA LAO RAO LL RL INF SUP
None


Study Map Point Catheter ECG Display Imaging Window Tools Help
209
-60
Loc
1.37
CL
LAT (ms)
Bi (mV)
200.0 mm/sec
MAP 1-2
REF 3-4
V1
REF 1-2
-180
0 sec
160
2-Map (49, 0)
-63 ms
LAT
-13 ms
-56 -49
2-Map (49, 0)
-129 ms
LAT
135 ms
-70 -47
1.43
1.00
AP PA LAO RAO LL RL INF SUP
AP PA LAO RAO LL RL INF SUP
None
AP PA LAO RAO LL RL INF SUP

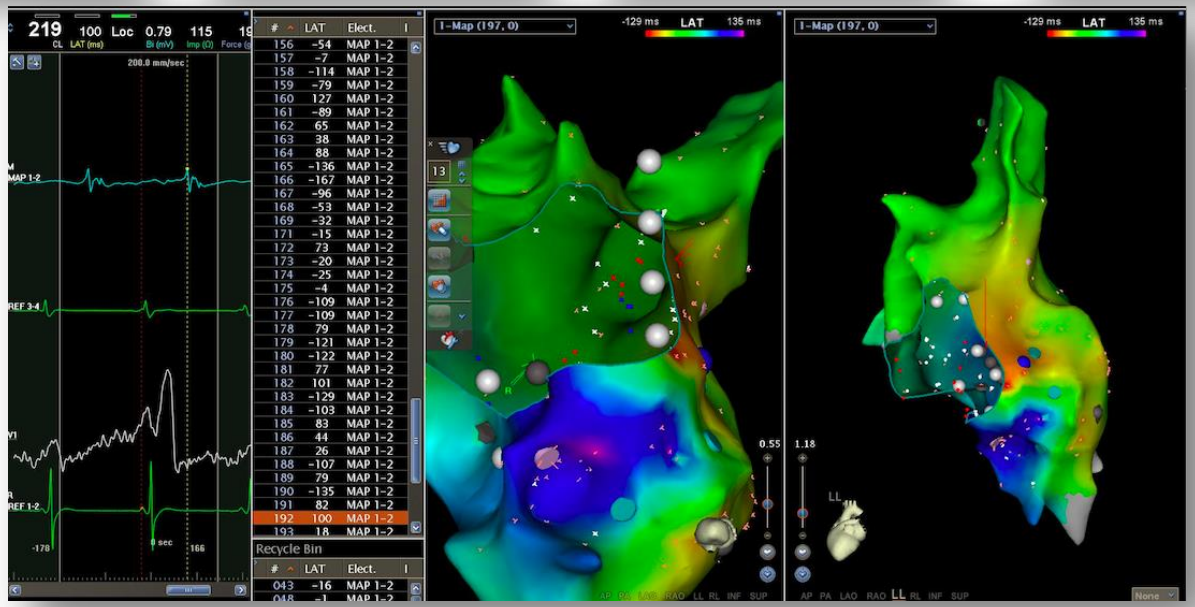


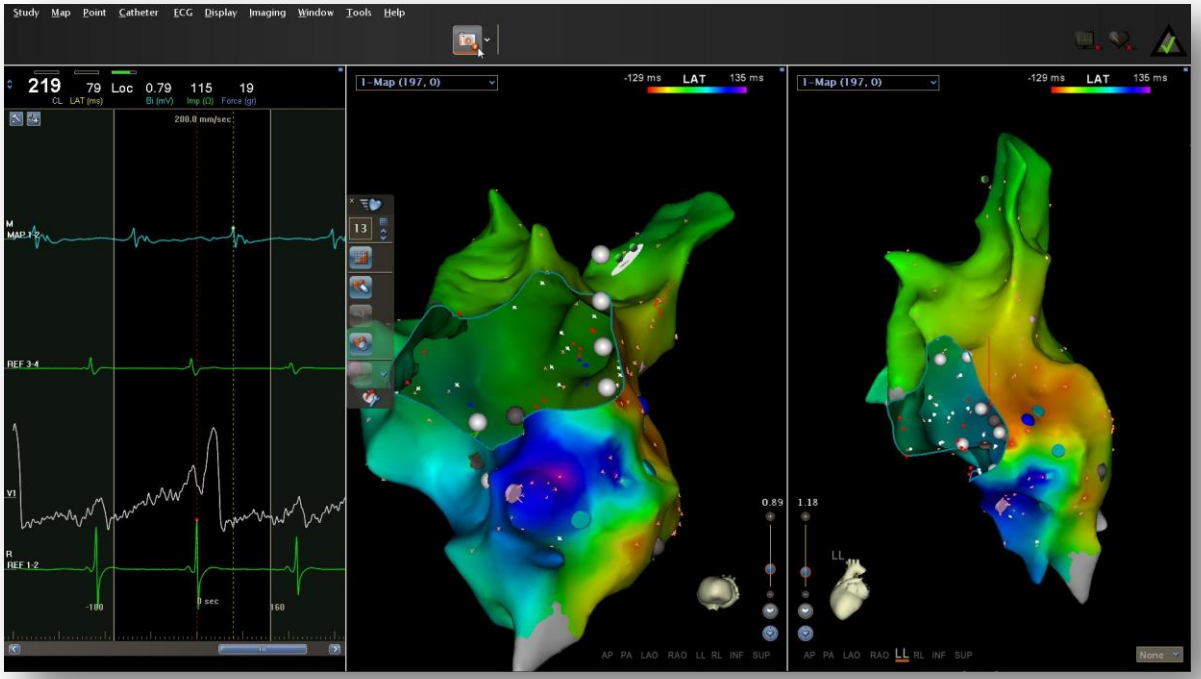


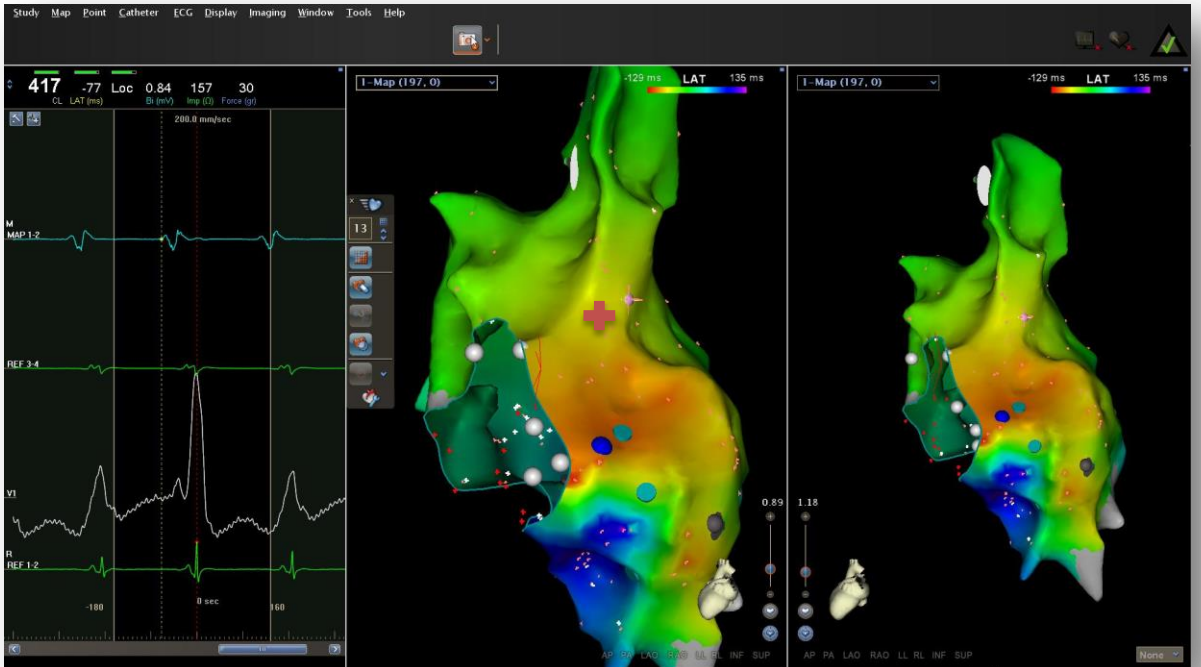


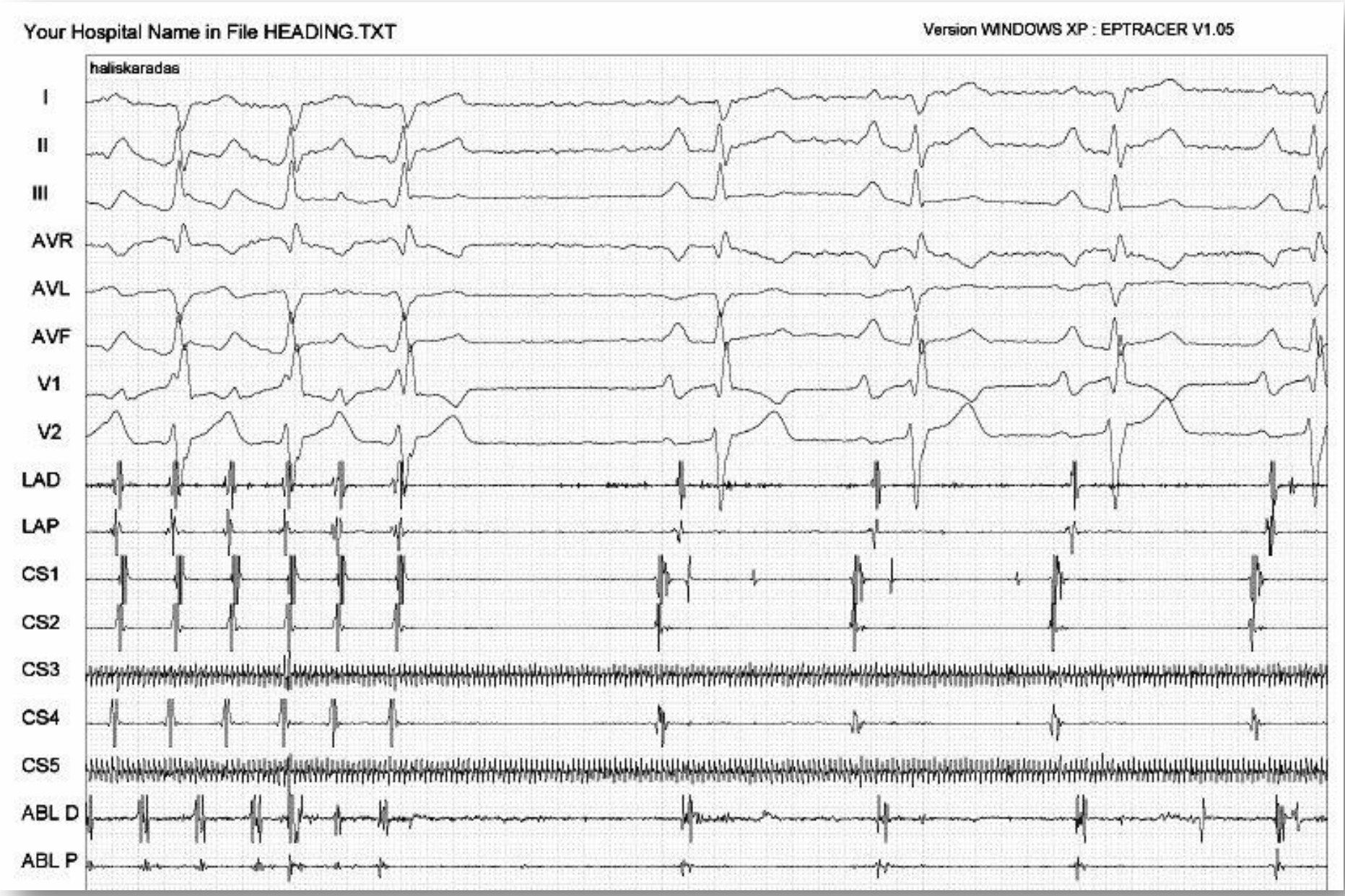


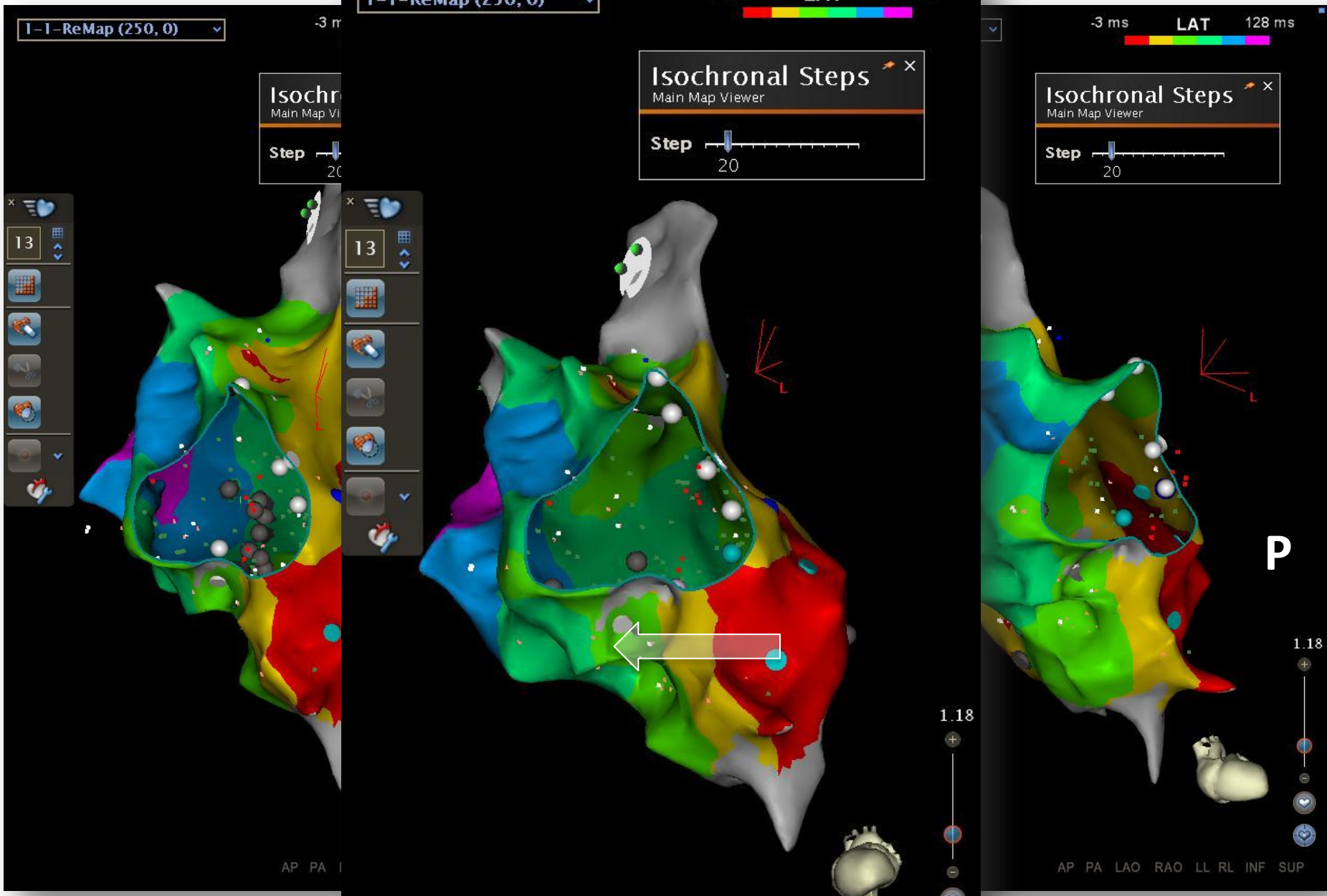
Window of Interest

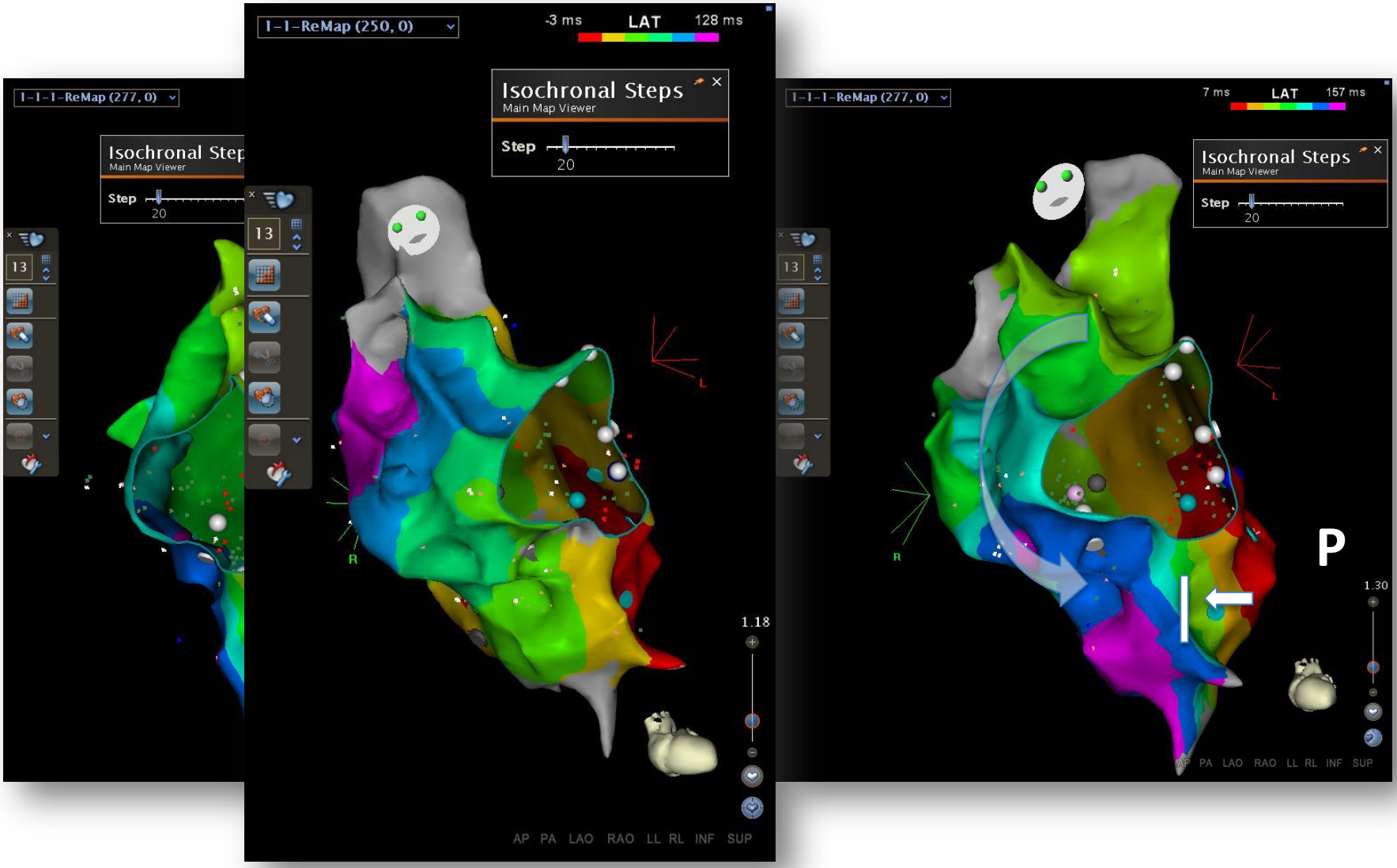


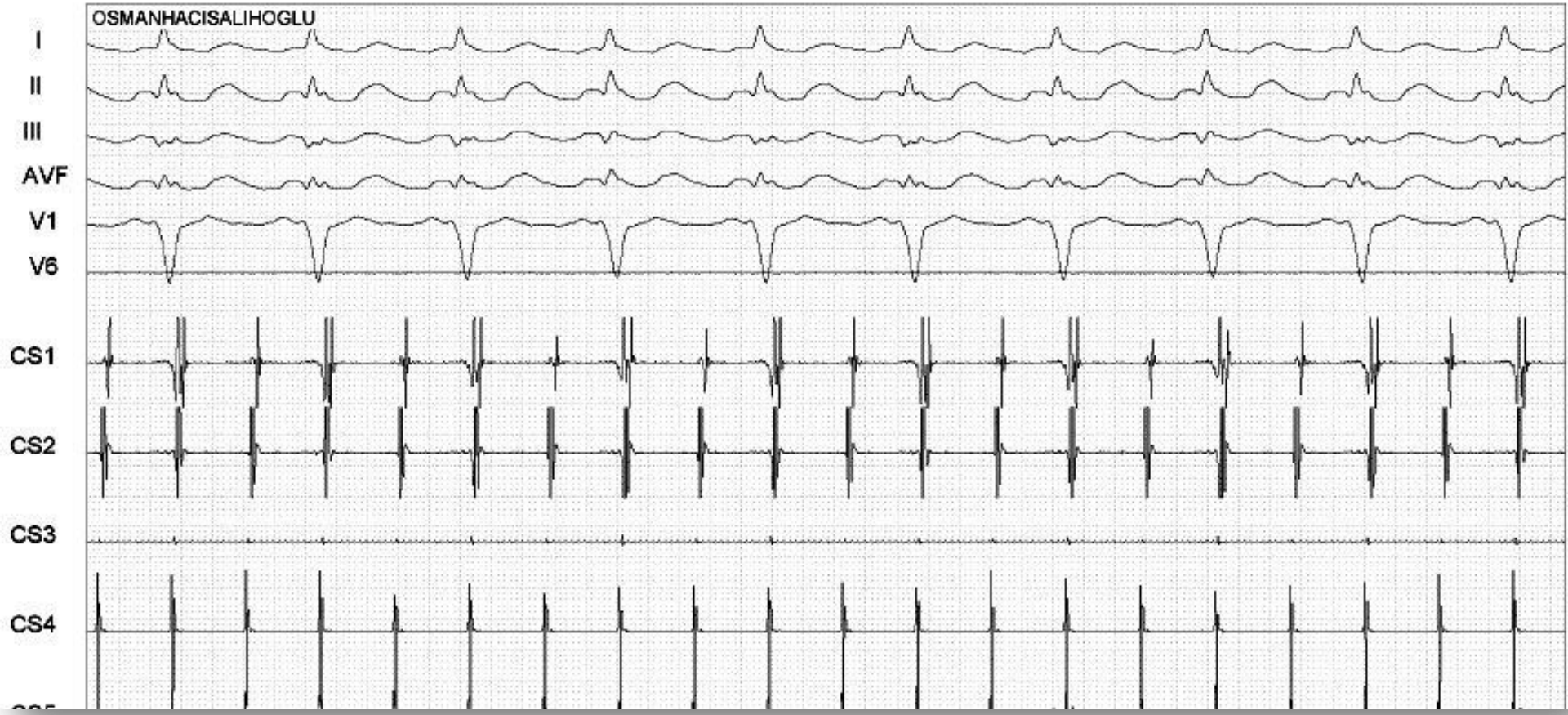

Study Map Point Catheter ECG Display Imaging Window Tools Help
219 79 Loc 0.79 115 19
CL LAT (ms) Bi (mV) Imp (Ω) Force (gr)
200.0 mm/sec
M MAP 1-2
REF 3-4
V1
R REF 1-2
-100
0 sec
160
1-Map (197, 0)
-129 ms LAT 135 ms
13
0.89
AP PA LAO RAO LL RL INF SUP
1-Map (197, 0)
-129 ms LAT 135 ms
1.18
LL
AP PA LAO RAO LL RL INF SUP
None


Study Map Point Catheter ECG Display Imaging Window Tools Help
417 -77 Loc 0.84 157 30
CL LAT (ms) Bi (mV) Imp (Ω) Force (gr)
200.0 mm/sec
M MAP 1-2
REF 3-4
V1
R REF 1-2
-180
0 sec
160
1-Map (197, 0)
-129 ms LAT 135 ms
13
0.89
AP PA LAO RAO LL RL INF SUP
1-Map (197, 0)
-129 ms LAT 135 ms
1.18
AP PA LAO RAO LL RL INF SUP
None

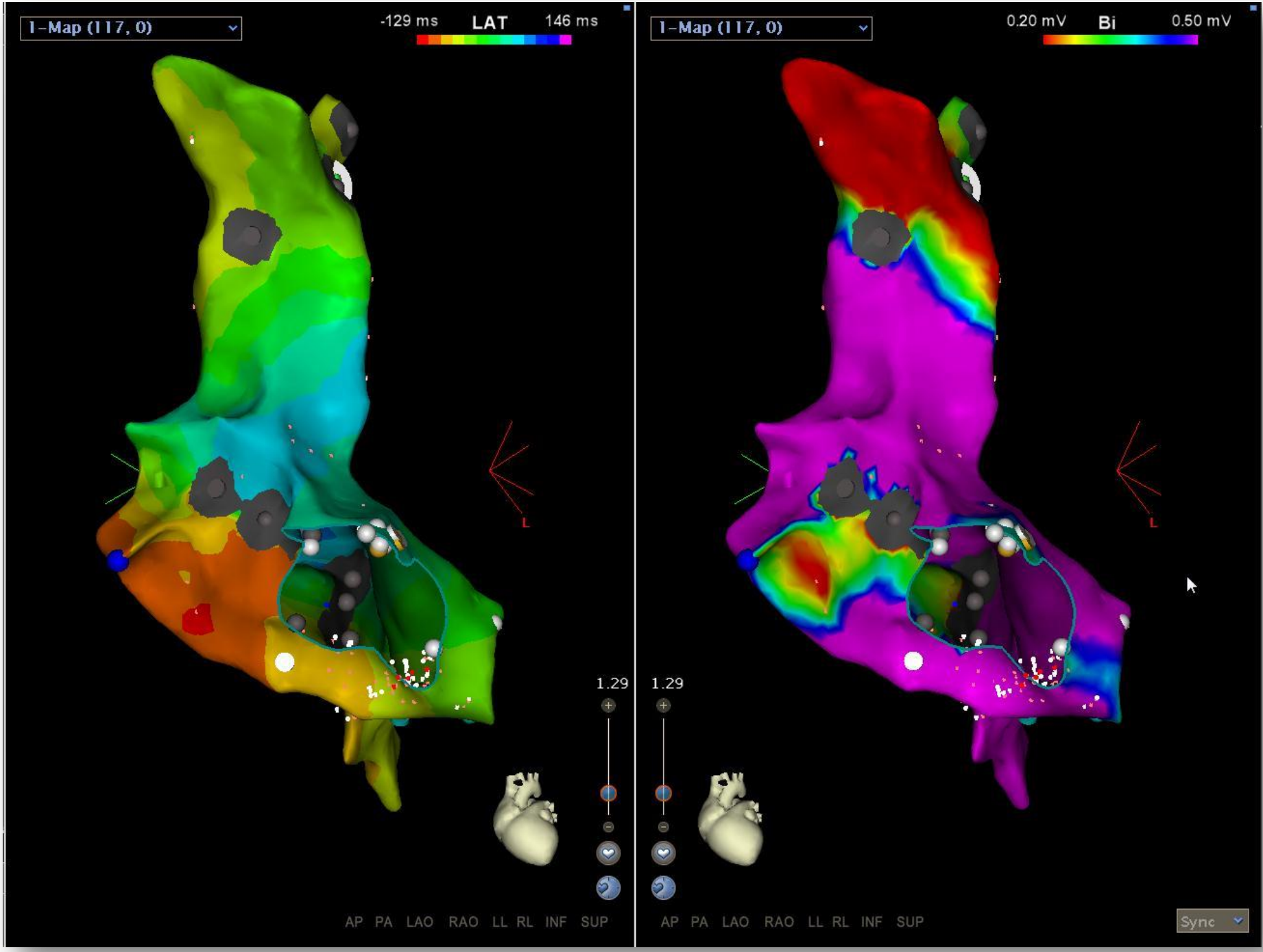

Your Hospital Name in File HEADING.TXT
Version WINDOWS XP : EPTRACER V1.05
haliskaradas
I
II
III
AVR
AVL
AVF
V1
V2
LAD
LAP
CS1
CS2
CS3
CS4
CS5
ABL D
ABL P

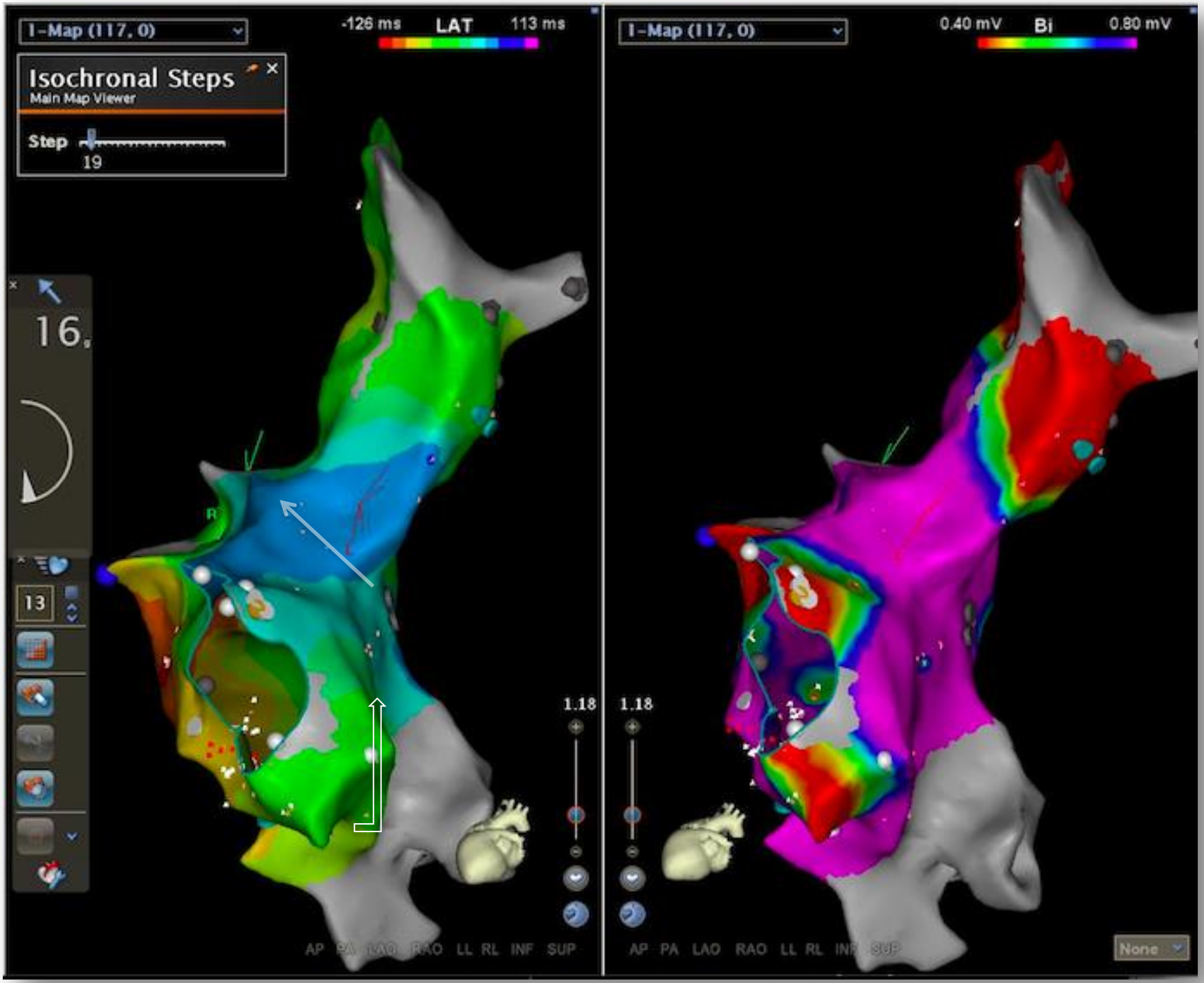

1-1-ReMap (250, 0)
-3 ms
LAT
128 ms
Isochronal Steps
Main Map Viewer
Step
20
13
1.18
P
AP PA LAO RAO LL RL INF SUP

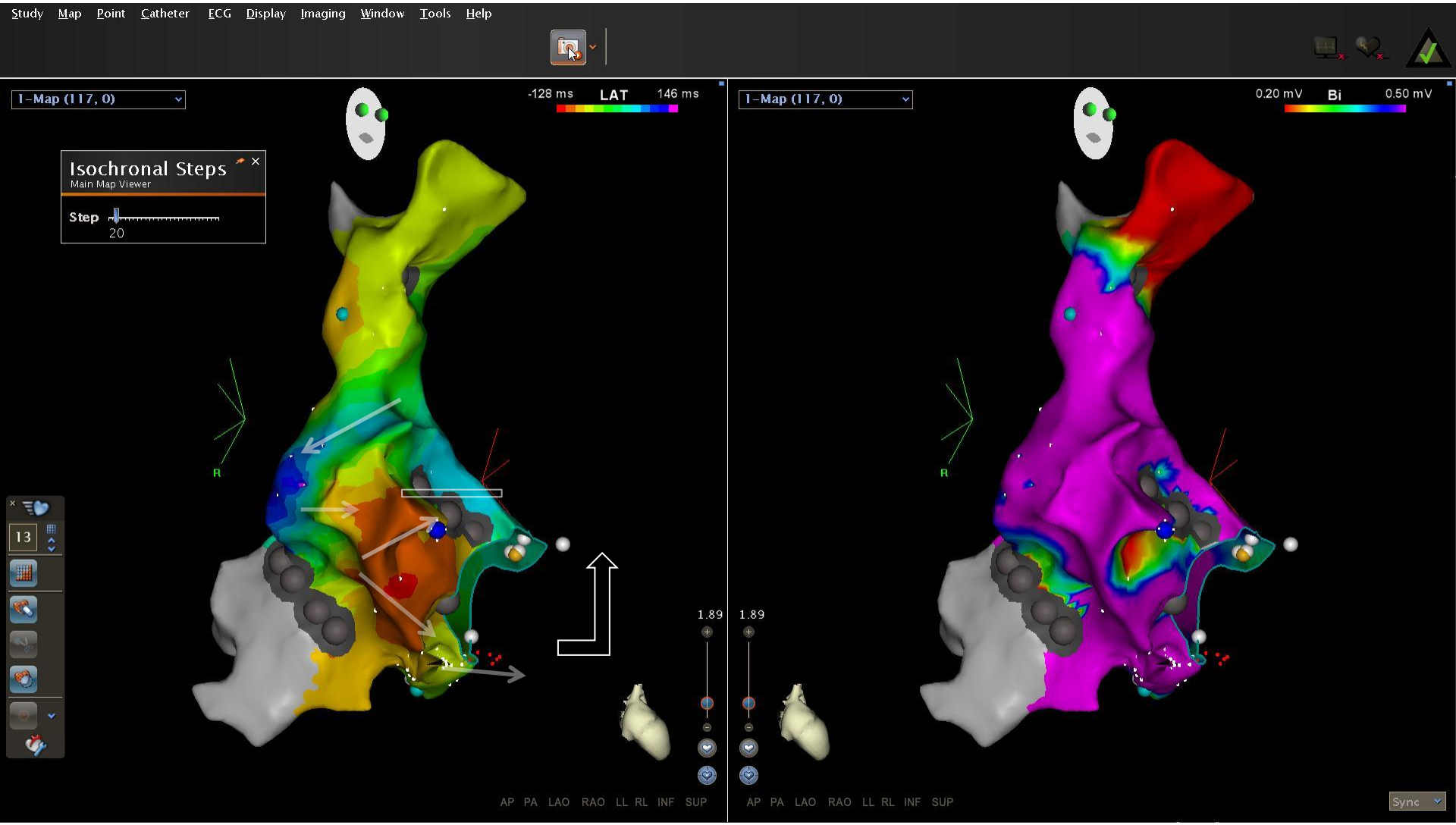

1-1-1-ReMap (277, 0)
Isochronal Step
Main Map Viewer
Step
20
1-1-ReMap (250, 0)
-3 ms
LAT
128 ms
Isochronal Steps
Main Map Viewer
Step
20
13
L
R
1.18
AP PA LAO RAO LL RL INF SUP
1-1-1-ReMap (277, 0)
7 ms
LAT
157 ms
Isochronal Steps
Main Map Viewer
Step
20
P
1.30
AP PA LAO RAO LL RL INF SUP

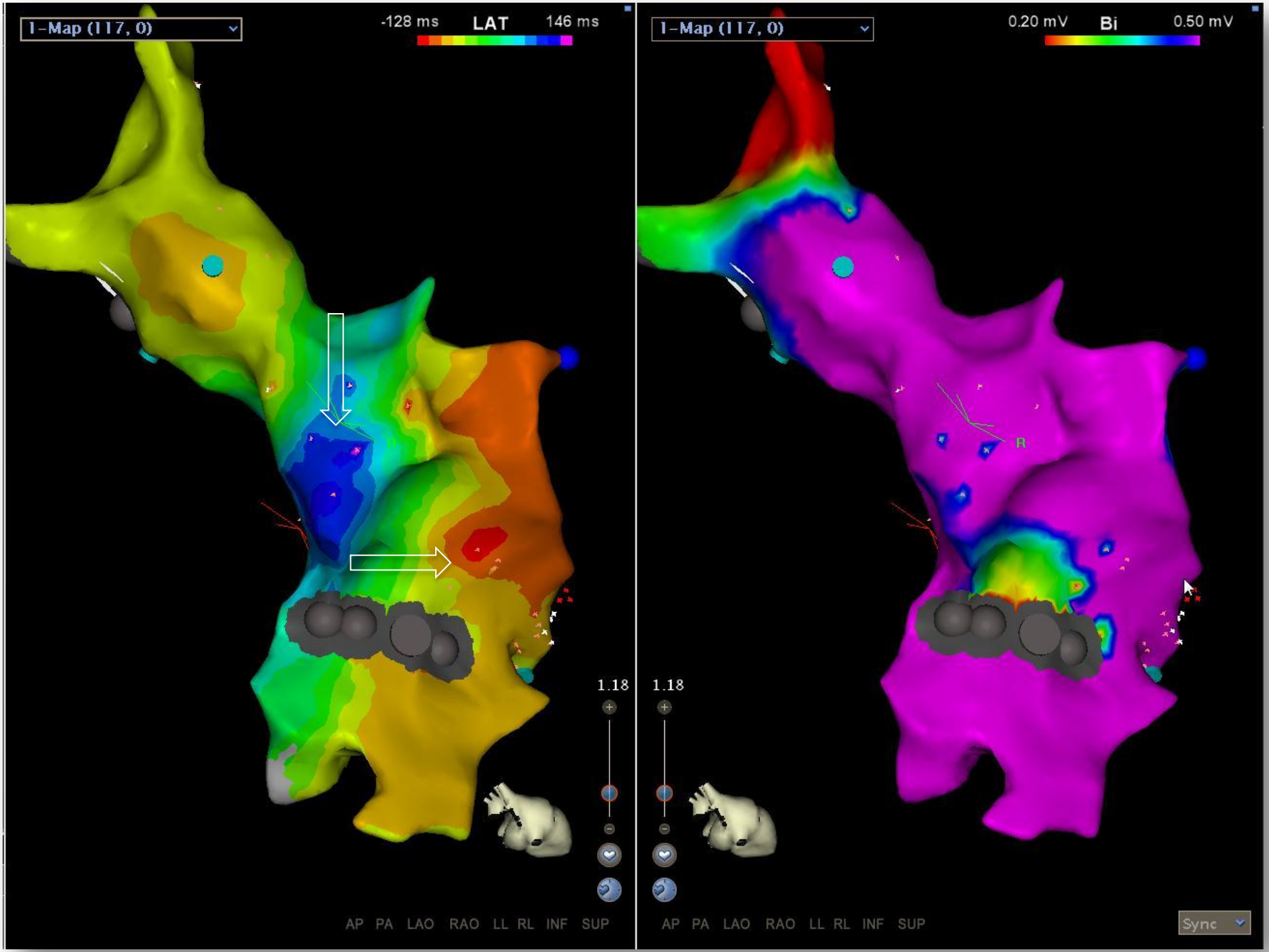


47 yaşında erkek hasta, 4yıl önce mitral kapak onarımı, 3 yıl önce sol atriyal reentry taşikardi ablasyonu, son bir aydır dirençli taşikardi

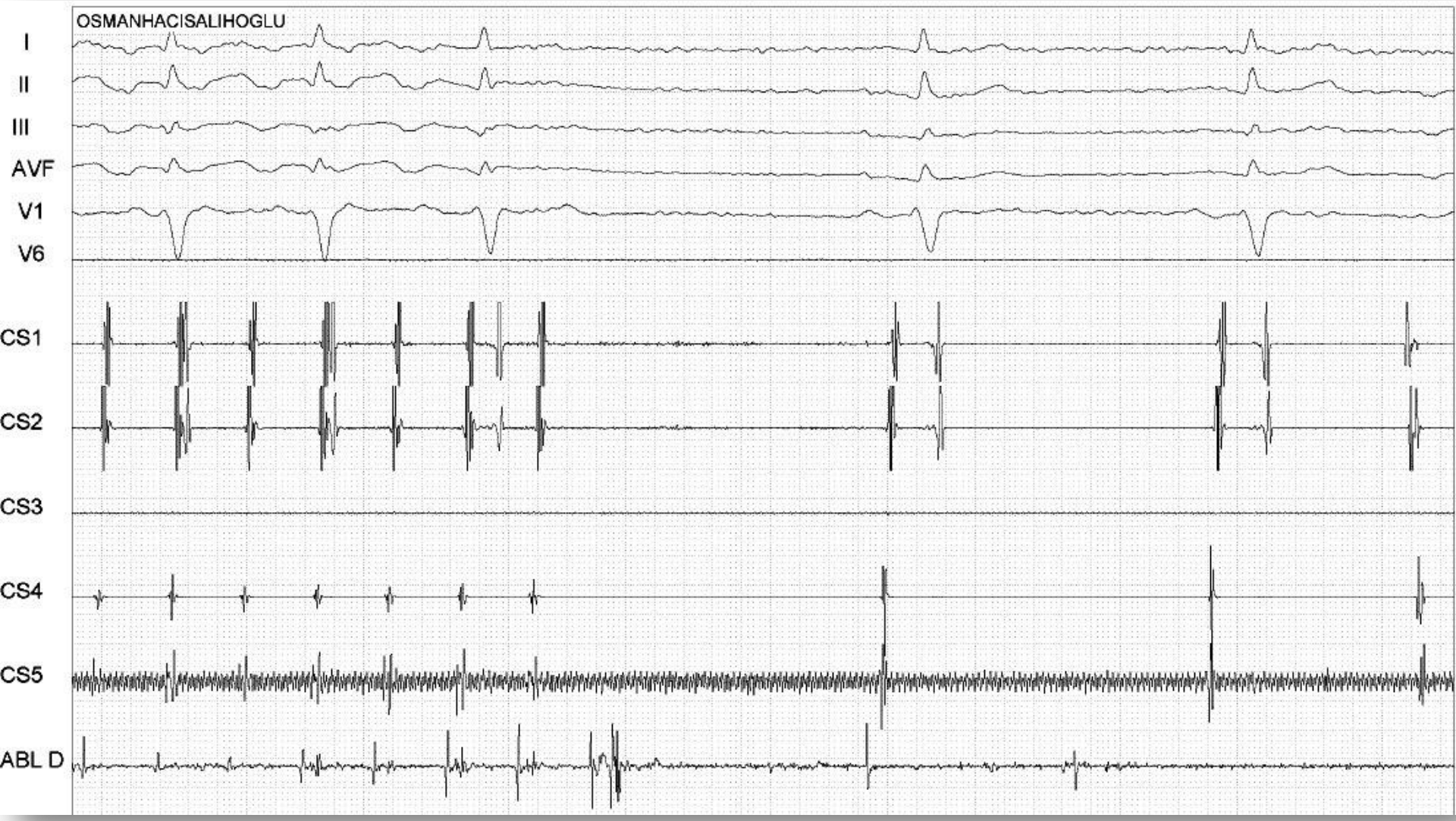

1-Map (117, 0)
-129 ms
LAT
146 ms
1.29
AP PA LAO RAO LL RL INF SUP
1-Map (117, 0)
0.20 mV
Bi
0.50 mV
1.29
AP PA LAO RAO LL RL INF SUP
Sync

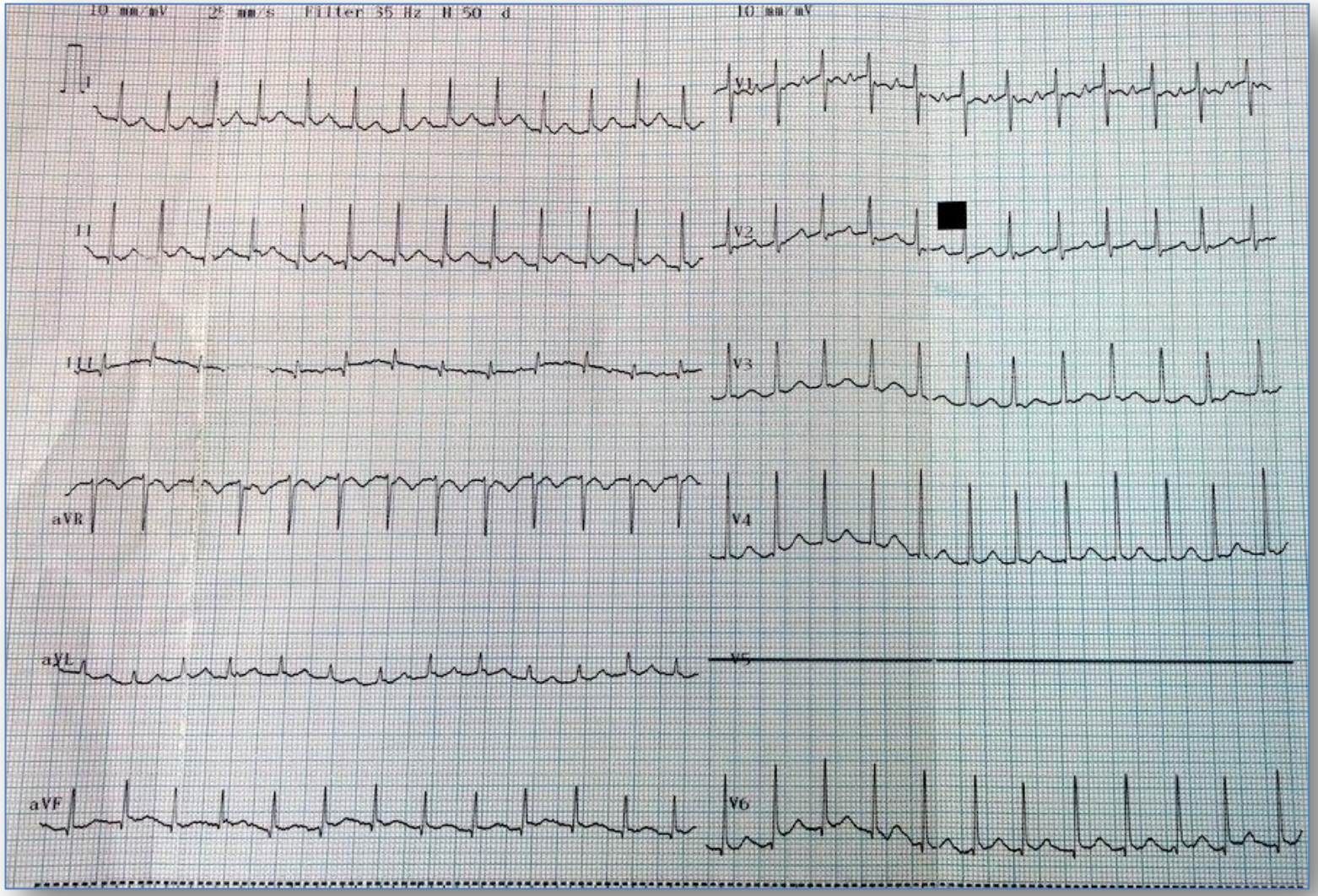

I-Map (117, 0)
-126 ms
LAT
113 ms
Isochronal Steps
Main Map Viewer
Step
19
16.
13
1.18
AP PA LAO RAO LL RL INF SUP
I-Map (117, 0)
0.40 mV
Bi
0.80 mV
1.18
AP PA LAO RAO LL RL INF SUP
None


Study Map Point Catheter ECG Display Imaging Window Tools Help
I-Map (117, 0)
-128 ms LAT 146 ms
Isochronal Steps
Main Map Viewer
Step
20
R
1.89
AP PA LAO RAO LL RL INF SUP
I-Map (117, 0)
0.20 mV Bi 0.50 mV
R
1.89
AP PA LAO RAO LL RL INF SUP
Sync

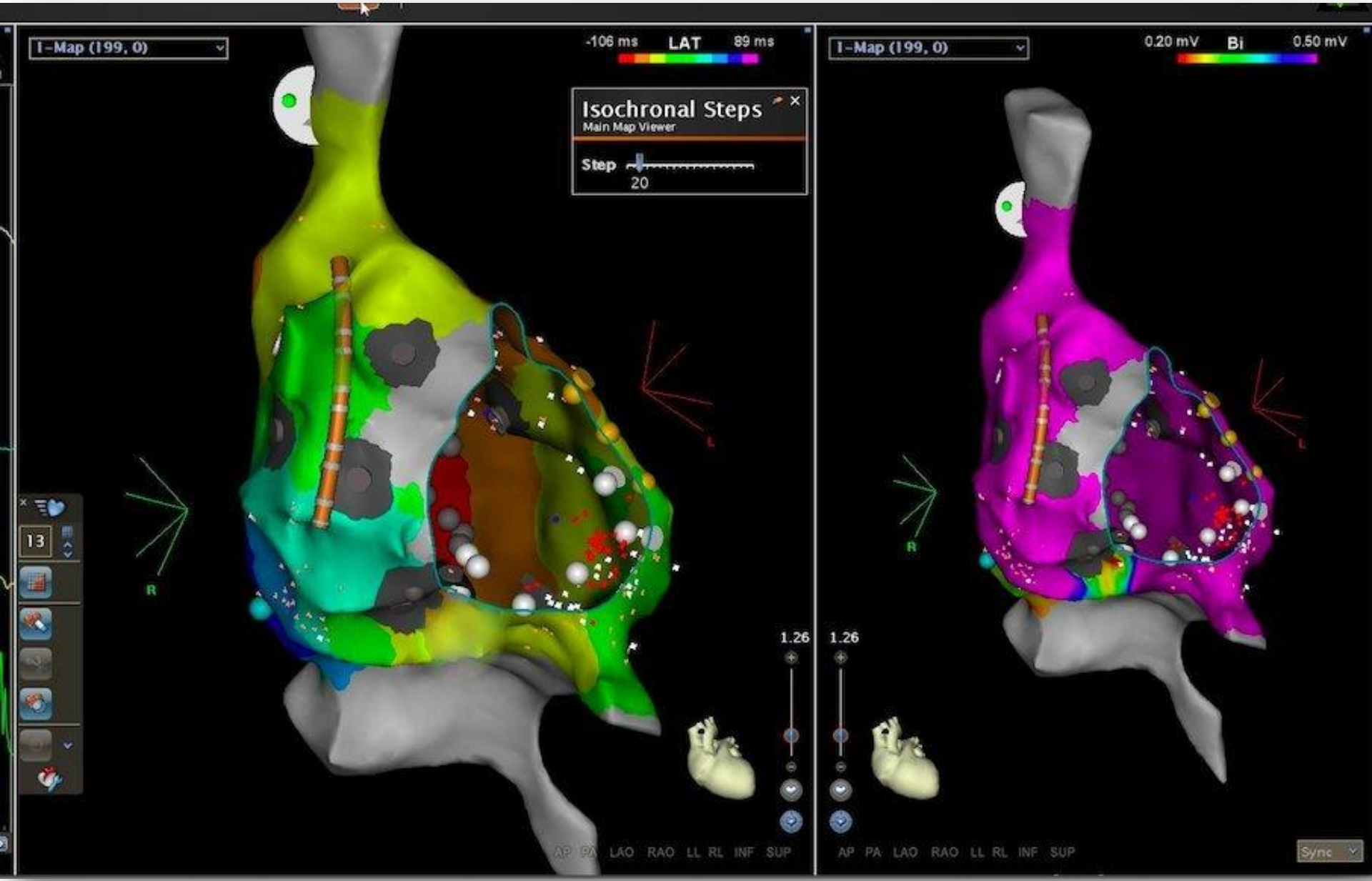

1-Map (117, 0)
-128 ms
LAT
146 ms
1.18
AP PA LAO RAO LL RL INF SUP
1-Map (117, 0)
0.20 mV
Bi
0.50 mV
R
1.18
AP PA LAO RAO LL RL INF SUP
Sync

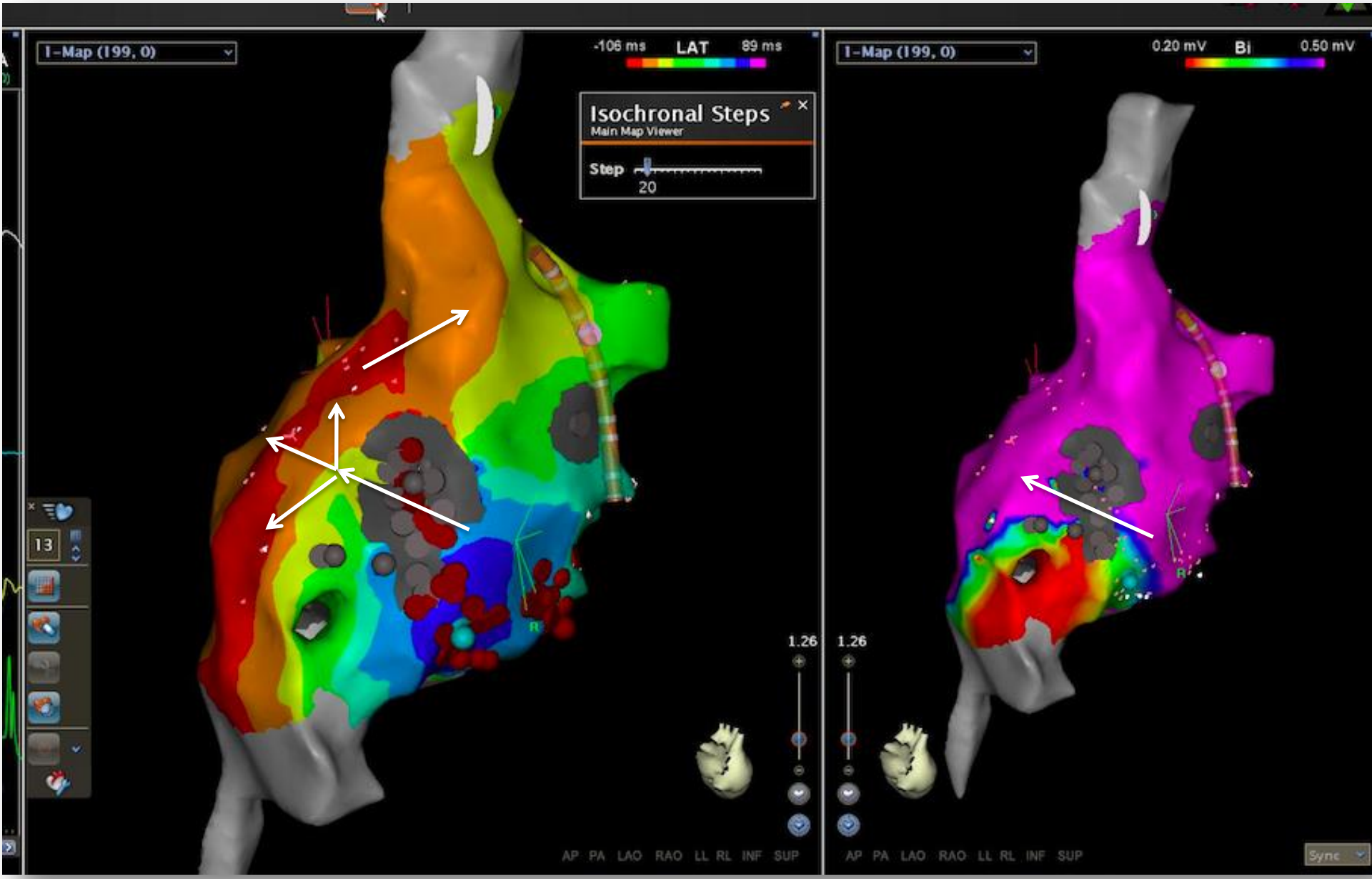

1-Map (117, 0)
-126 ms
LAT
113 ms
Isochronal Steps
Main Map Viewer
Step
19
14
13
1.18
AP PA LAO RAO LL RL INF SUP
1-Map (117, 0)
0.50 mV
Bi
1.00 mV
1.18
AP PA LAO RAO LL RL INF SUP
Sync
241
CL
-28
LAT (ms)
Loc
0.21
Bi (mV)
N/A
Imp (Ω)
200.0 mm/sec
MAP 1
M
MAP 1-2
V1
R
REF 7-8
-200
0 sec
200

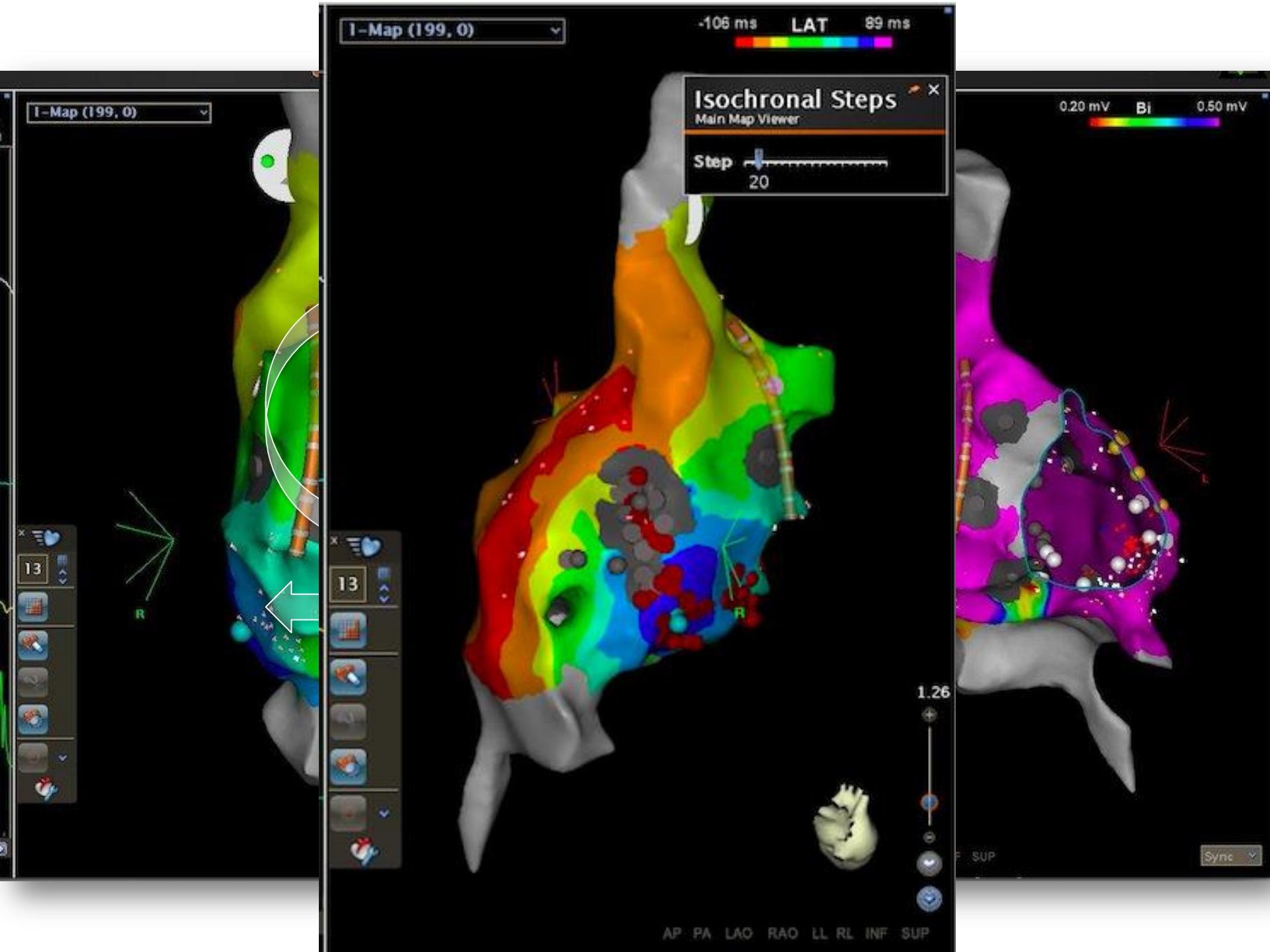

OSMANHACISALIHOGLU
I
II
III
AVF
V1
V6
CS1
CS2
CS3
CS4
CS5
ABL D

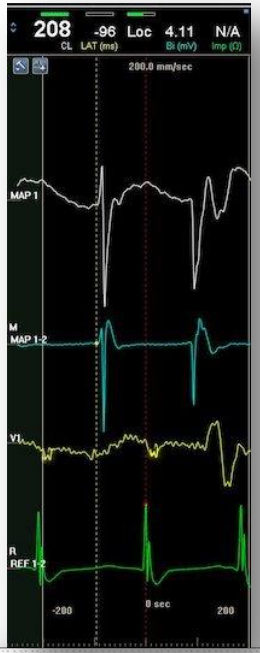


38 yaşında kadın hasta, 10 yıl önce sekundum ASD operasyonu, 3 aydır kesintisiz taşikardi

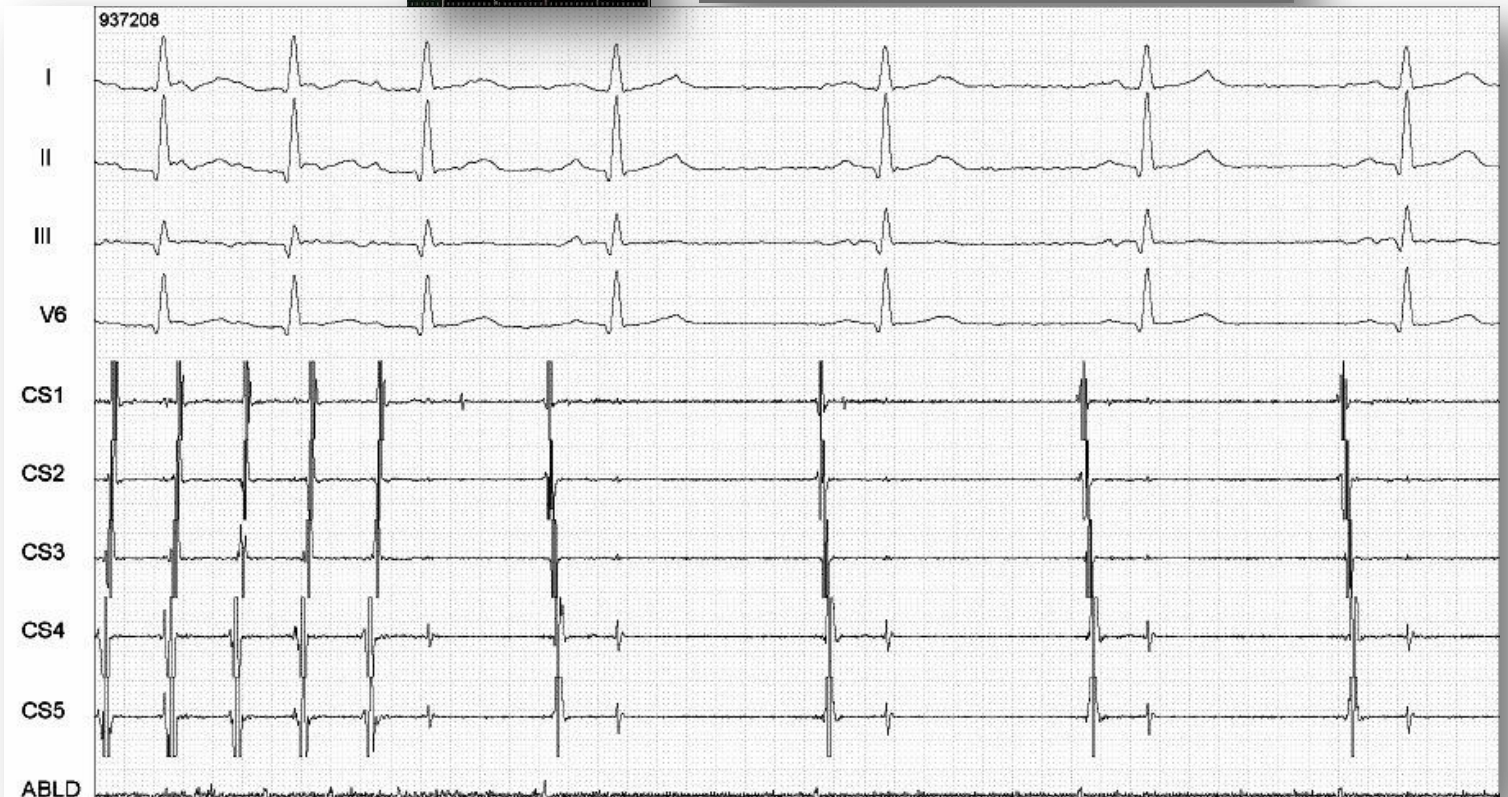

I-Map (199, 0)
-106 ms
LAT
89 ms
Isochronal Steps
Main Map Viewer
Step
20
13
R
1.26
AP PA LAO RAO LL RL INF SUP
I-Map (199, 0)
0.20 mV
Bi
0.50 mV
R
1.26
AP PA LAO RAO LL RL INF SUP
Sync

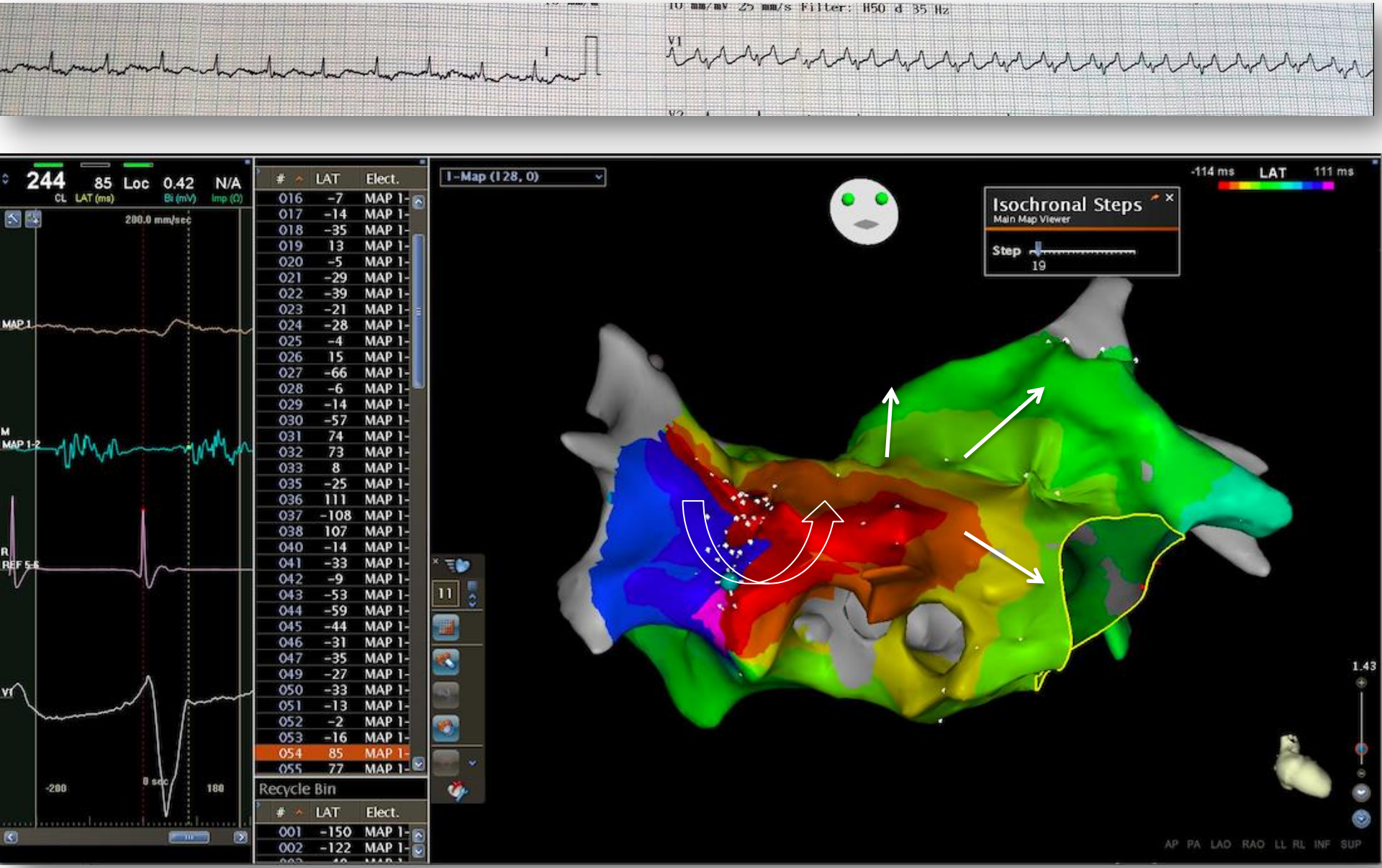

I-Map (199, 0)
-106 ms
LAT
89 ms
Isochronal Steps
Main Map Viewer
Step
20
13
1.26
AP PA LAO RAO LL RL INF SUP
I-Map (199, 0)
0.20 mV
Bi
0.50 mV
1.26
AP PA LAO RAO LL RL INF SUP
Sync


I-Map (199, 0)
-106 ms
LAT
89 ms
Isochronal Steps
Main Map Viewer
Step
20
13
1.26
AP PA LAO RAO LL RL INF SUP
0.20 mV
Bi
0.50 mV
Sync

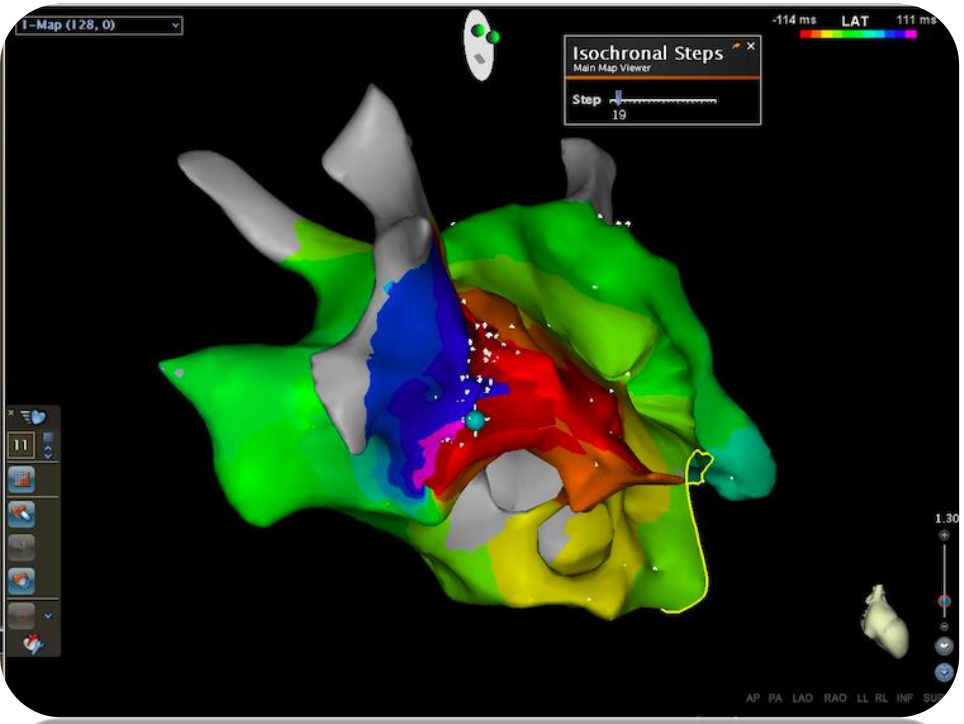

208
CL
-96
LAT (ms)
Loc
4.11
Bi (mV)
N/A
Imp (Ω)
200.0 mm/sec
MAP 1
M
MAP 1-2
Y1
R
REF 1-2
-200
0 sec
200

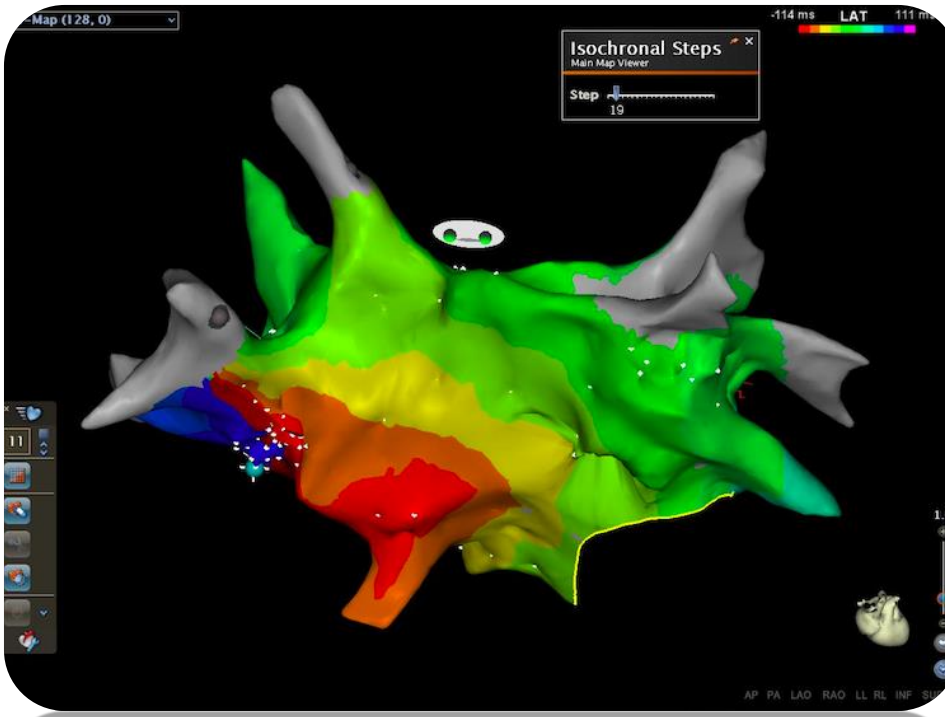

I-Map (199, 0)
-106 ms
LAT
89 ms
Isochronal Steps
Main Map Viewer
Step
20
13
1.26
AP PA LAO RAO LL RL INF SUP

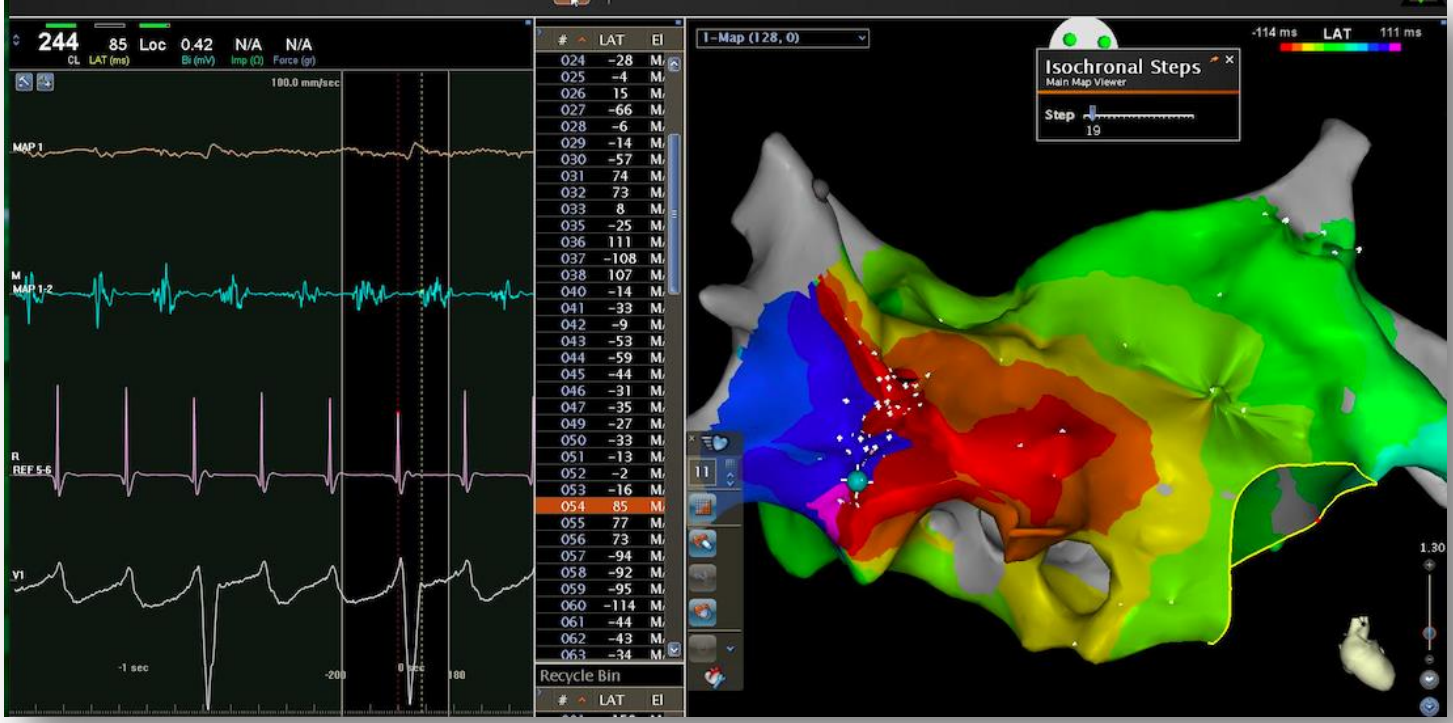

937208
I
II
III
V6
CS1
CS2
CS3
CS4
CS5
ABLD

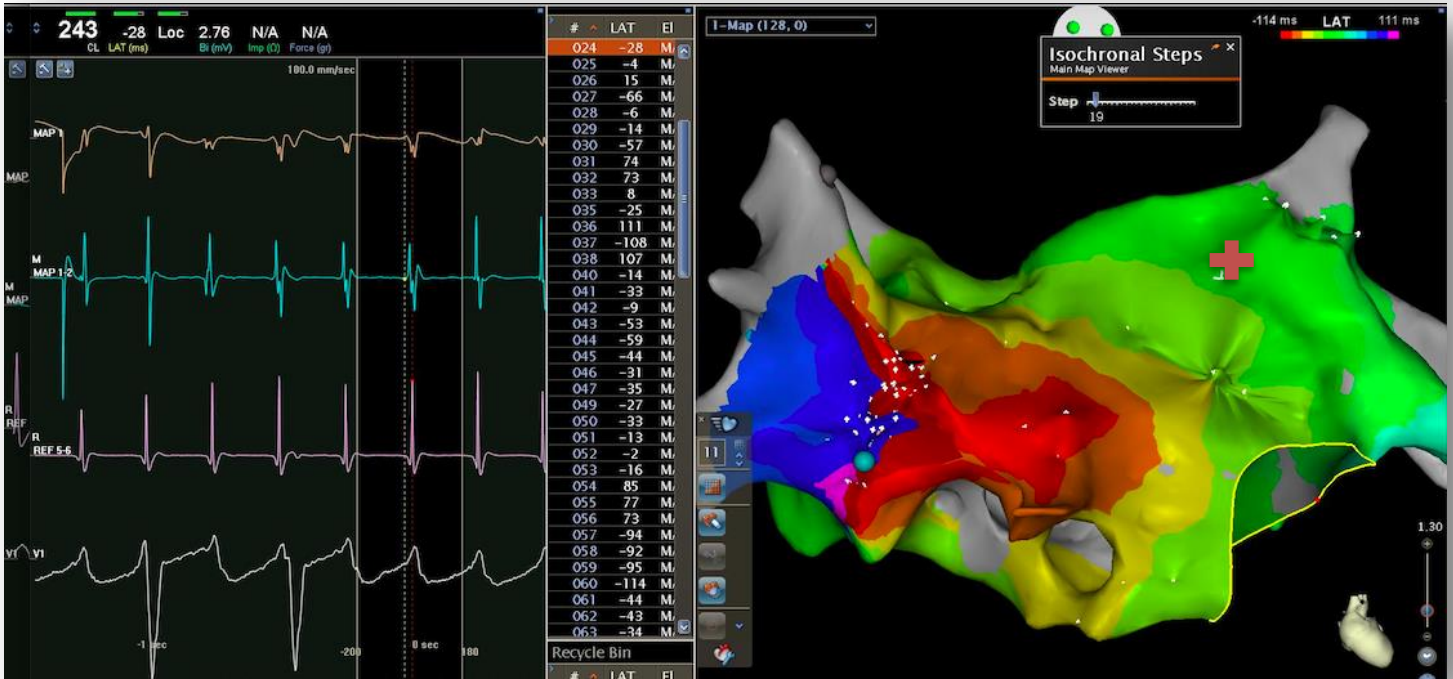


56 yaşında erkek hasta ,3 ay önce carto ile pulmoner ven izolasyonu, işlemden bir ay sonra başlayan dirençli atriyal taşikardi atağı


Isochronal Steps
Main Map Viewer
Step
19
-114 ms
LAT
111 ms
AP PA LAO RAO LL RL INF


Isochronal Steps
Main Map Viewer
Step
19
-114 ms
LAT
AP PA LAO RAO LL RL INF


244
85
Loc
0.42
N/A
N/A
CL
LAT (ms)
Bi (mV)
Imp (Ω)
Force (gr)
100.0 mm/sec
MAP 1
MAP 1-2
REF 5-6
V1
-1 sec
-200
0 sec
180
LAT EI
024 -28
025 -4
026 15
027 -66
028 -6
029 -14
030 -57
031 74
032 73
033 8
035 -25
036 111
037 -108
038 107
040 -14
041 -33
042 -9
043 -53
044 -59
045 -44
046 -31
047 -35
049 -27
050 -33
051 -13
052 -2
053 -16
054 85
055 77
056 73
057 -94
058 -92
059 -95
060 -114
061 -44
062 -43
063 -34
Recycle Bin
LAT EI
I-Map (128, 0)
-114 ms
LAT
111 ms
Isochronal Steps
Main Map Viewer
Step
19
11
1.30


243
-28
Loc
2.76
N/A
N/A
CL
LAT (ms)
Bi (mV)
Imp (Ω)
Force (gr)
100.0 mm/sec
MAP 1
MAP
MAP 1-2
REF
REF 5-6
V1
-1 sec
-200
0 sec
180
LAT EI
024 -28
025 -4
026 15
027 -66
028 -6
029 -14
030 -57
031 74
032 73
033 8
035 -25
036 111
037 -108
038 107
040 -14
041 -33
042 -9
043 -53
044 -59
045 -44
046 -31
047 -35
049 -27
050 -33
051 -13
052 -2
053 -16
054 85
055 77
056 73
057 -94
058 -92
059 -95
060 -114
061 -44
062 -43
063 -34
Recycle Bin
LAT EI
I-Map (128, 0)
-114 ms
LAT
111 ms
Isochronal Steps
Main Map Viewer
Step
19
11
1.30

3D Başarı =

- Fökal, Reentry ayrımı
- Anotomik komşulukların iyi bilinmesi
- Doğru boşluktan emin olmak
- Doğru ve stabil referans seçmek
- Her aritmide mutlaka skar mapping yapmak
- Doğru (dinamik) “window of interest”
- “Isochronal steps “ üzerinen analiz ve reentry halkasını tam olarak çıkarmak
- Istmusu hedeflemek

Teşekkürler…