JHRS 2021 第67回 日本不整脈心電学会学術大会

7/2 (金)
9:10～10:40
ZOOM

Ask the Expert: Intracardiac EGM Session


日本大学　永嶋 孝一


大垣市民病院　森島 逸郎

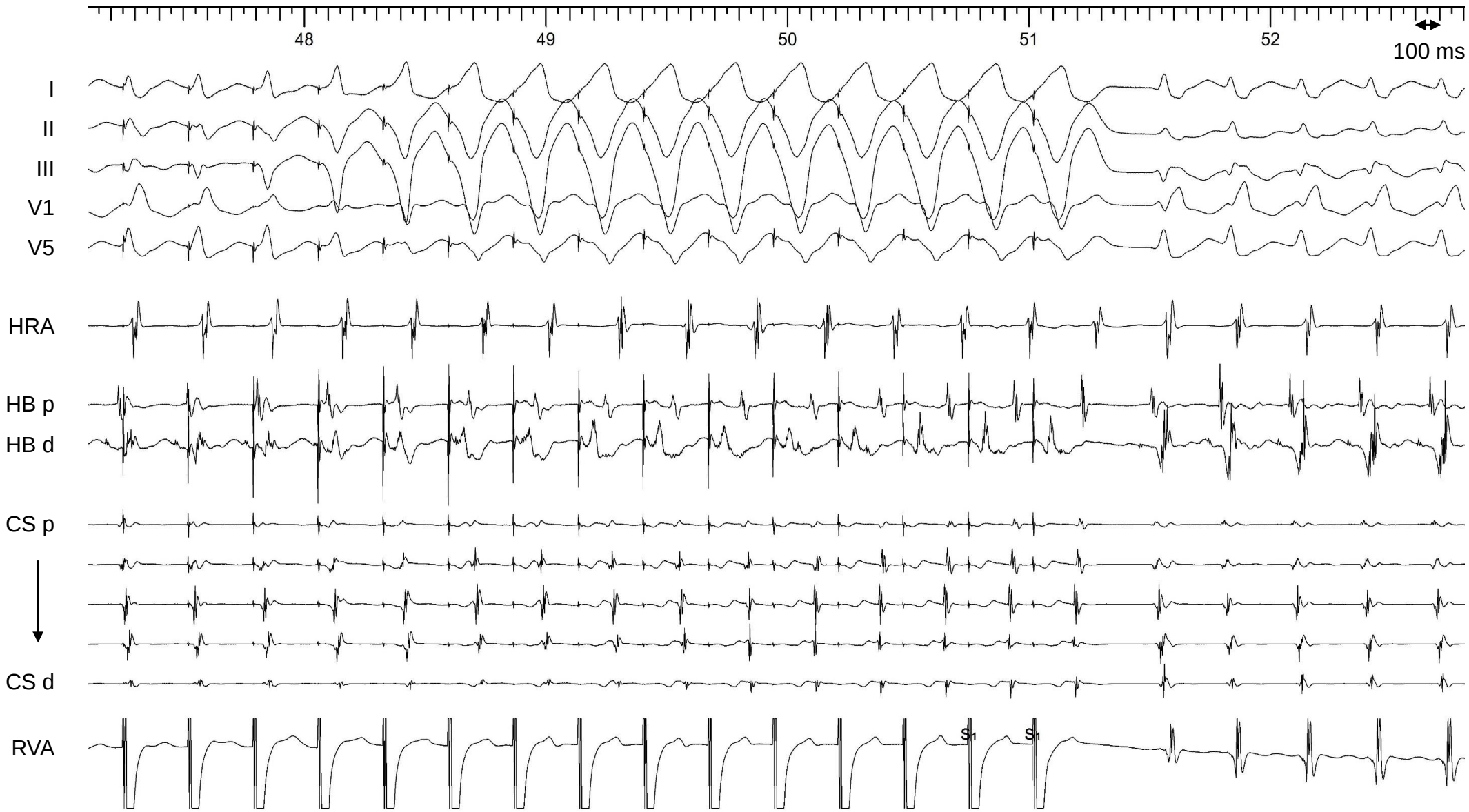

筑波大学　野上 昭彦

https://www.ace-enterprise.net/jhrs2020/seminar.html#a_koukai

QRコード、上記アドレスから、事前予習用のEGMを閲覧できます！

Medtronic

Case 1: One EGM-tracing tells all



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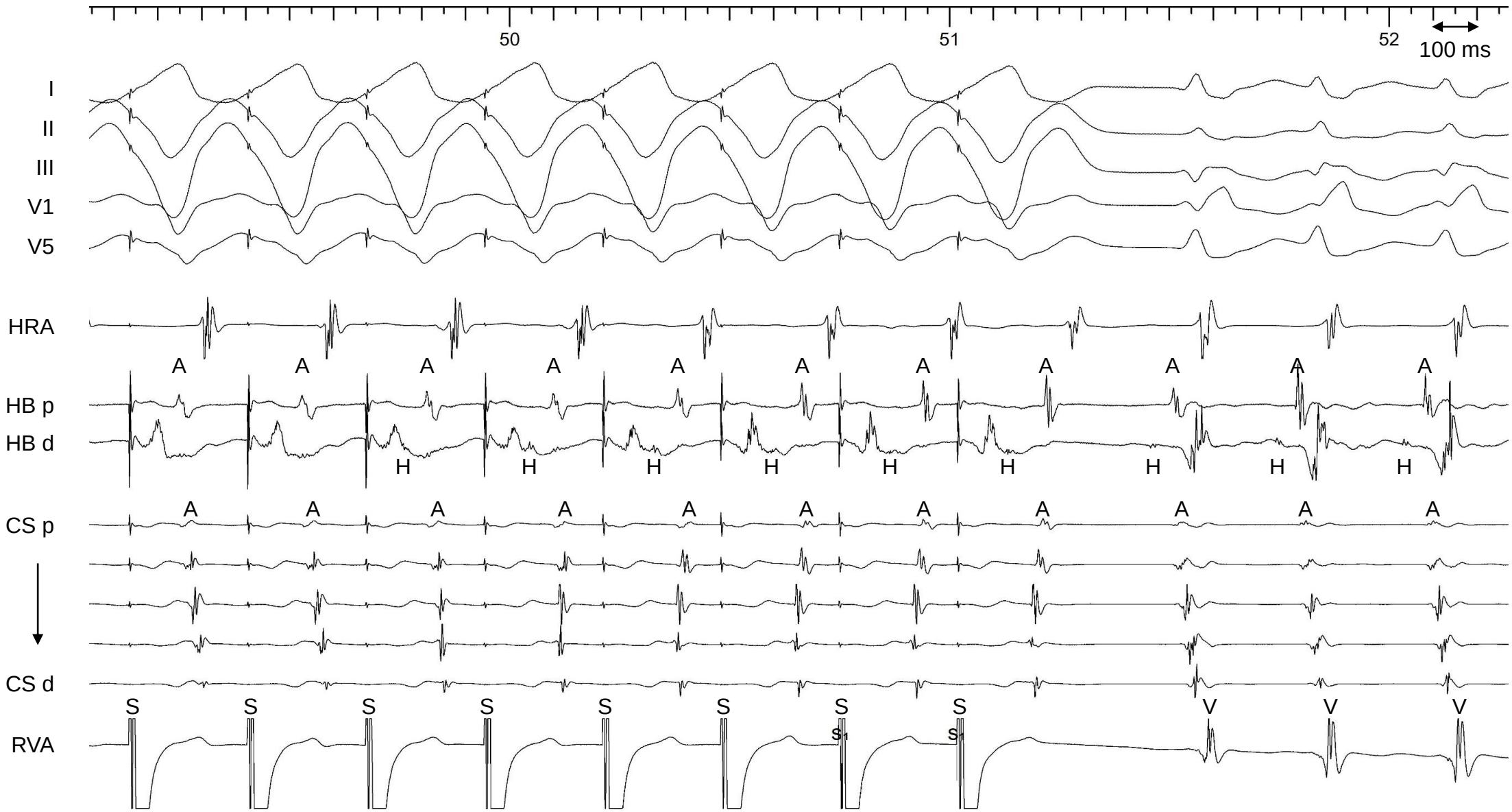

Q1-1: 診断は？

1. AT
2. ORT
3. AVNRT
4. AT + bystander left lateral AP
5. AVNRT + bystander left lateral AP

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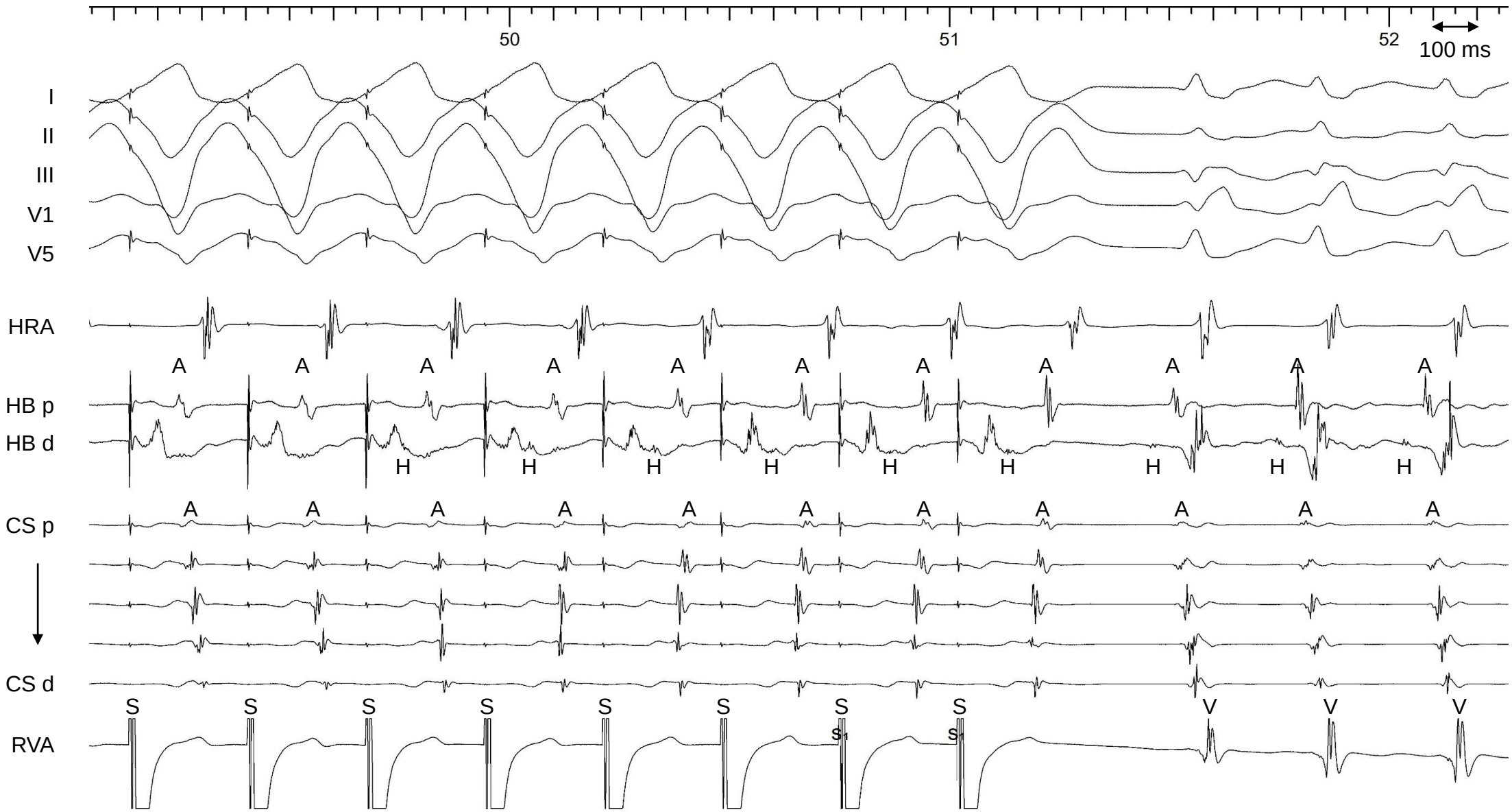

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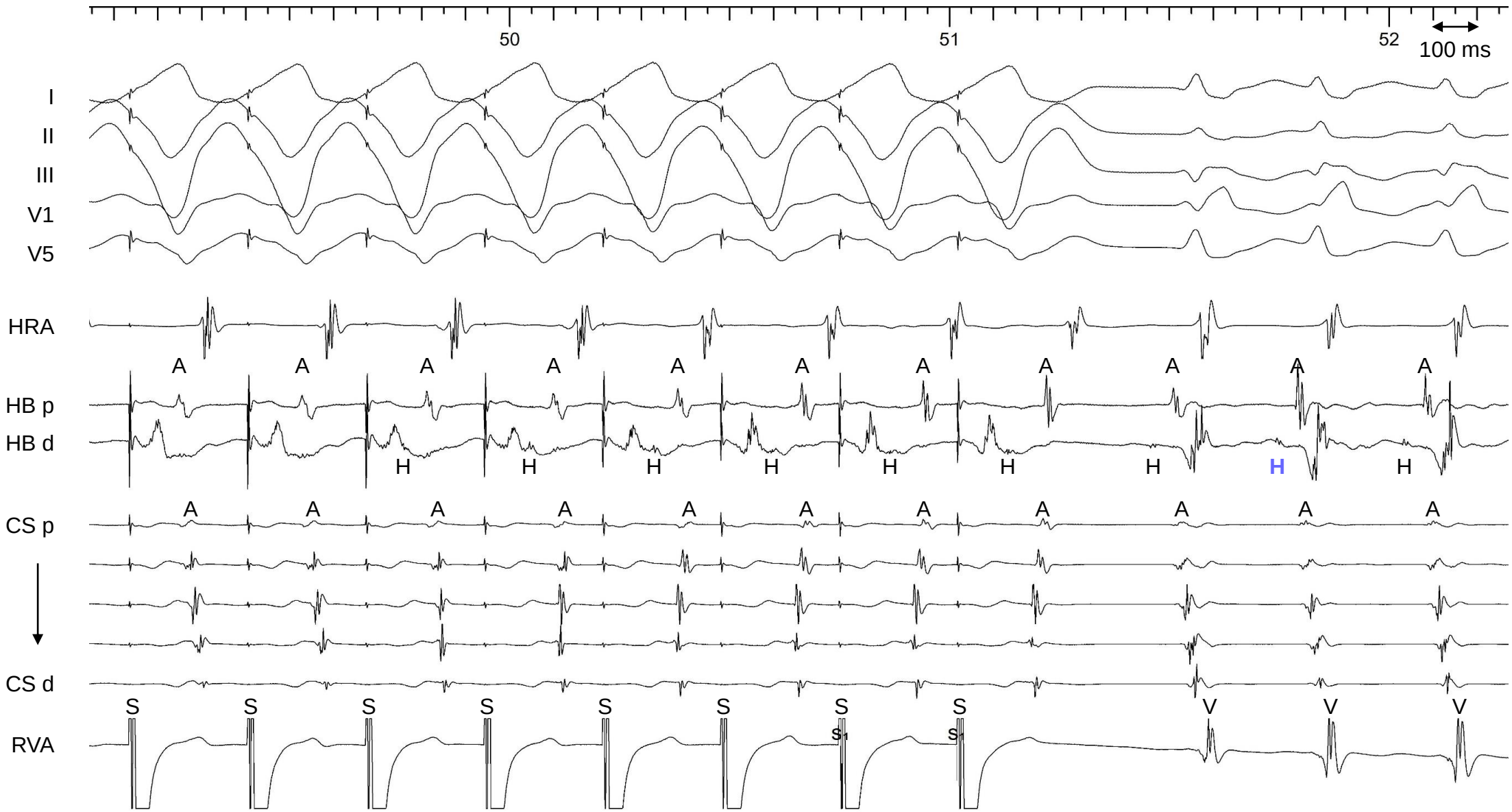

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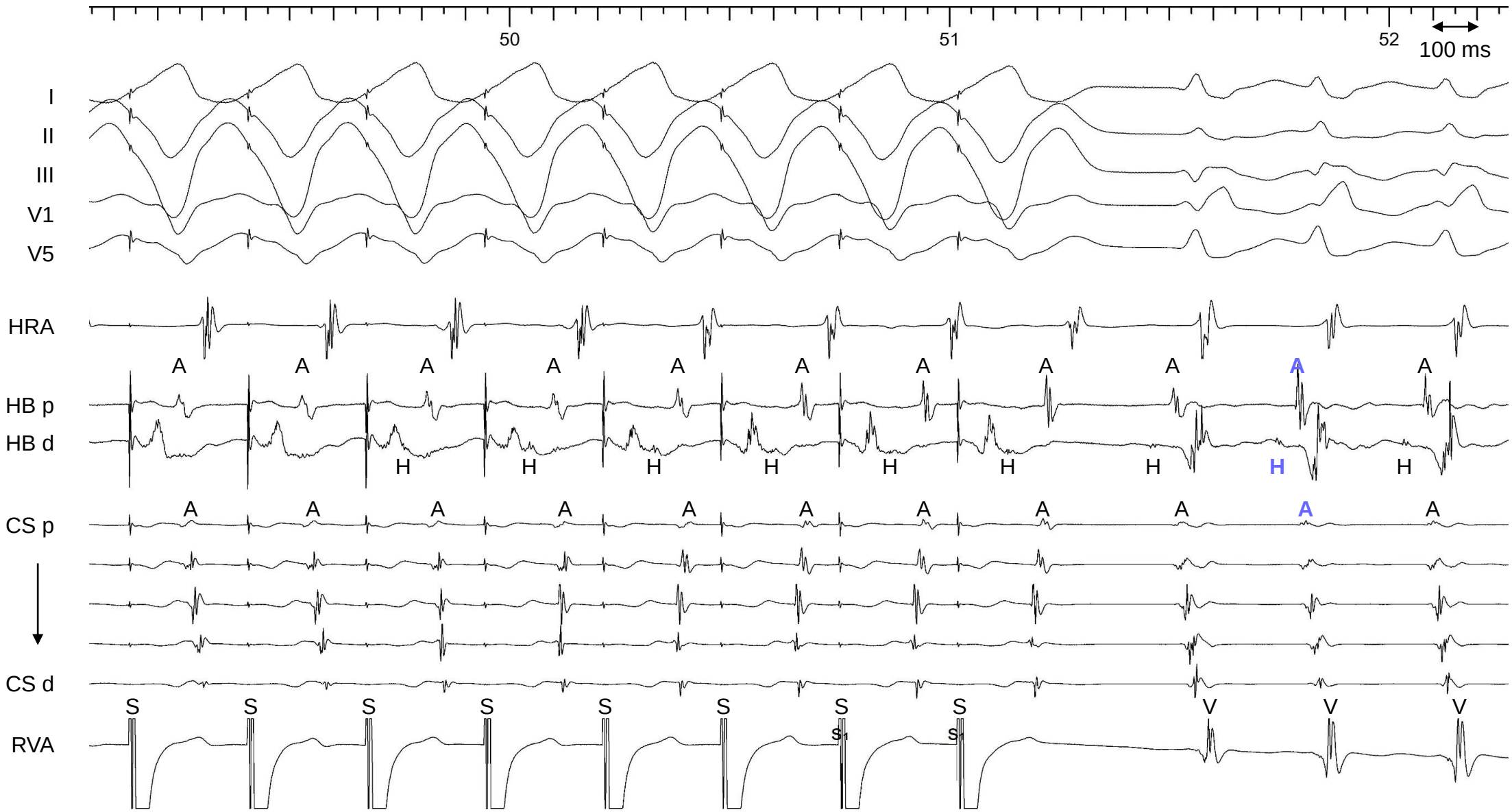

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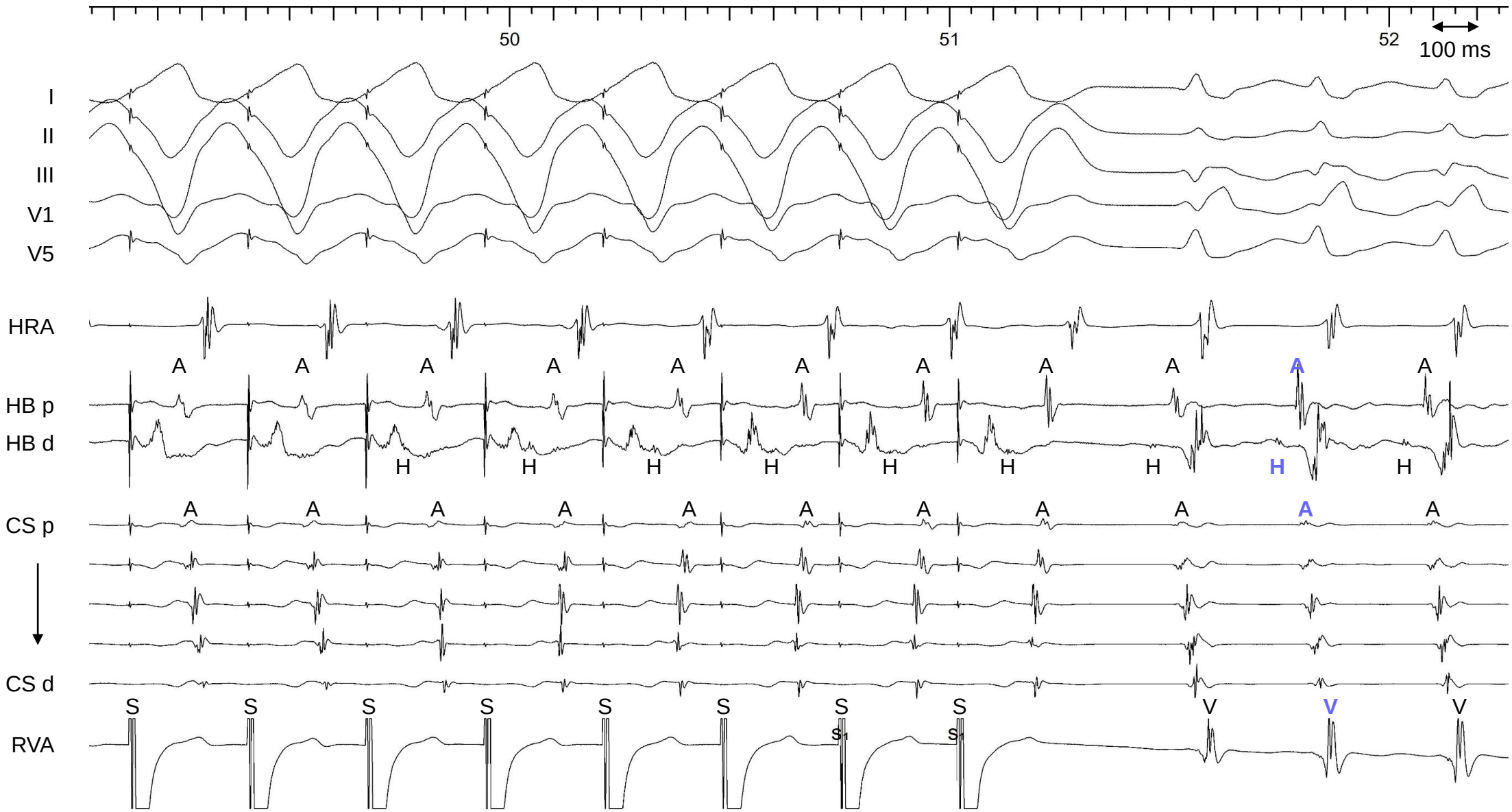

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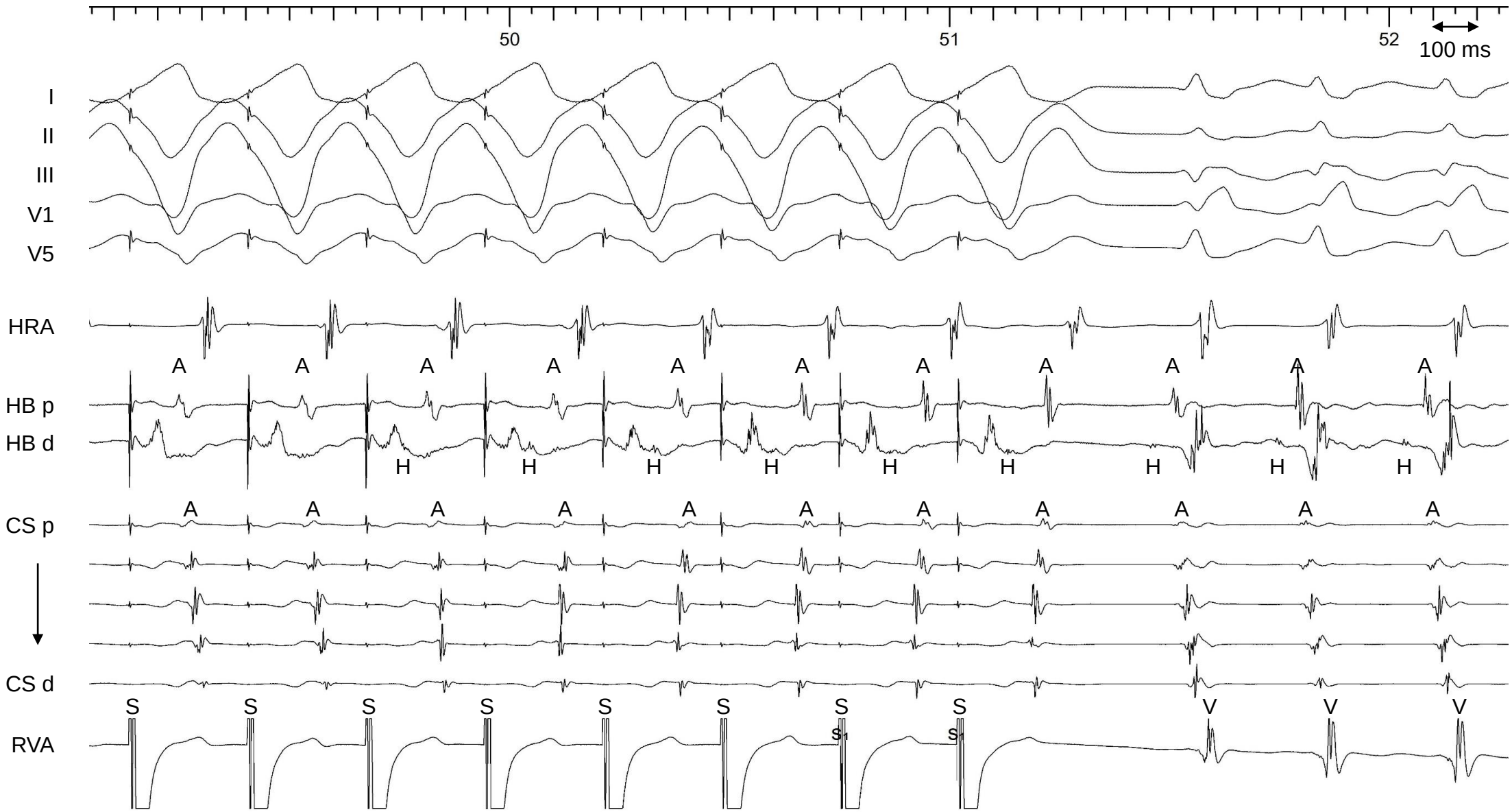

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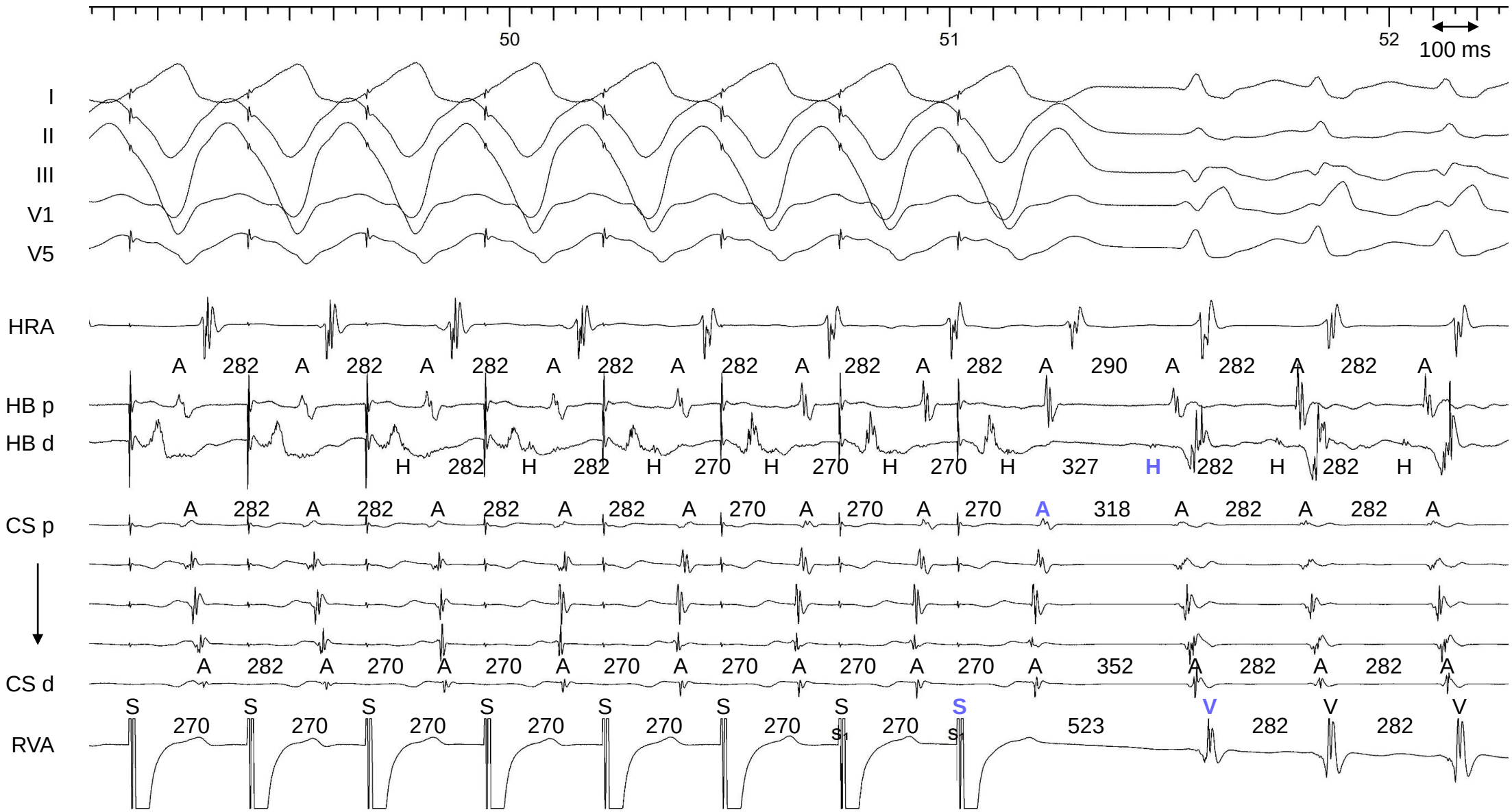

Q1-1: 診断は？

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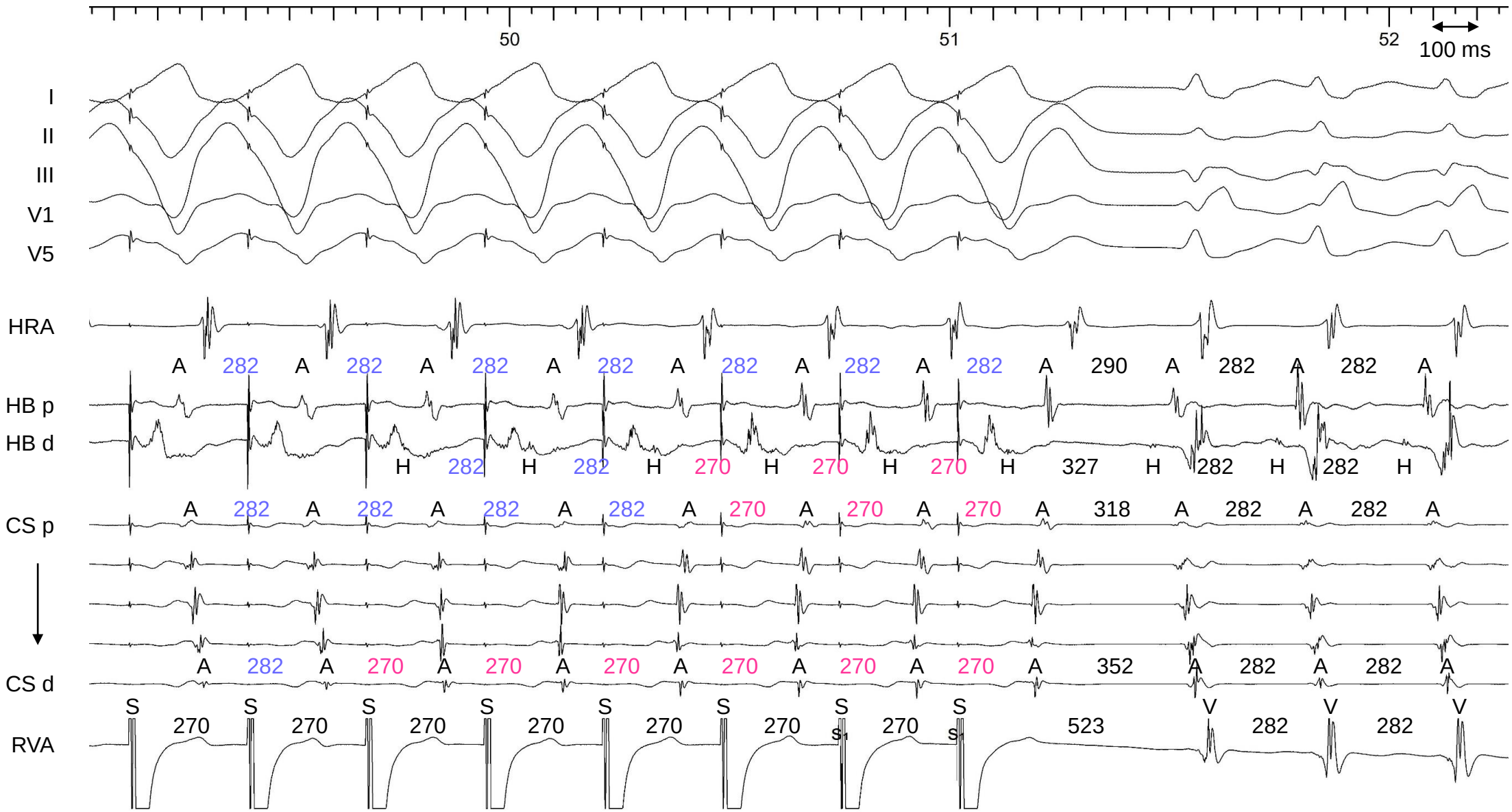
4. AT + bystander left lateral AP
5. AVNRT + bystander left lateral AP

と思われたが、George Klein先生から鋭い査読が…

HBのAがentrainされていないので、VAVとは判断できないのでは？

Case 1: One EGM-tracing tells all



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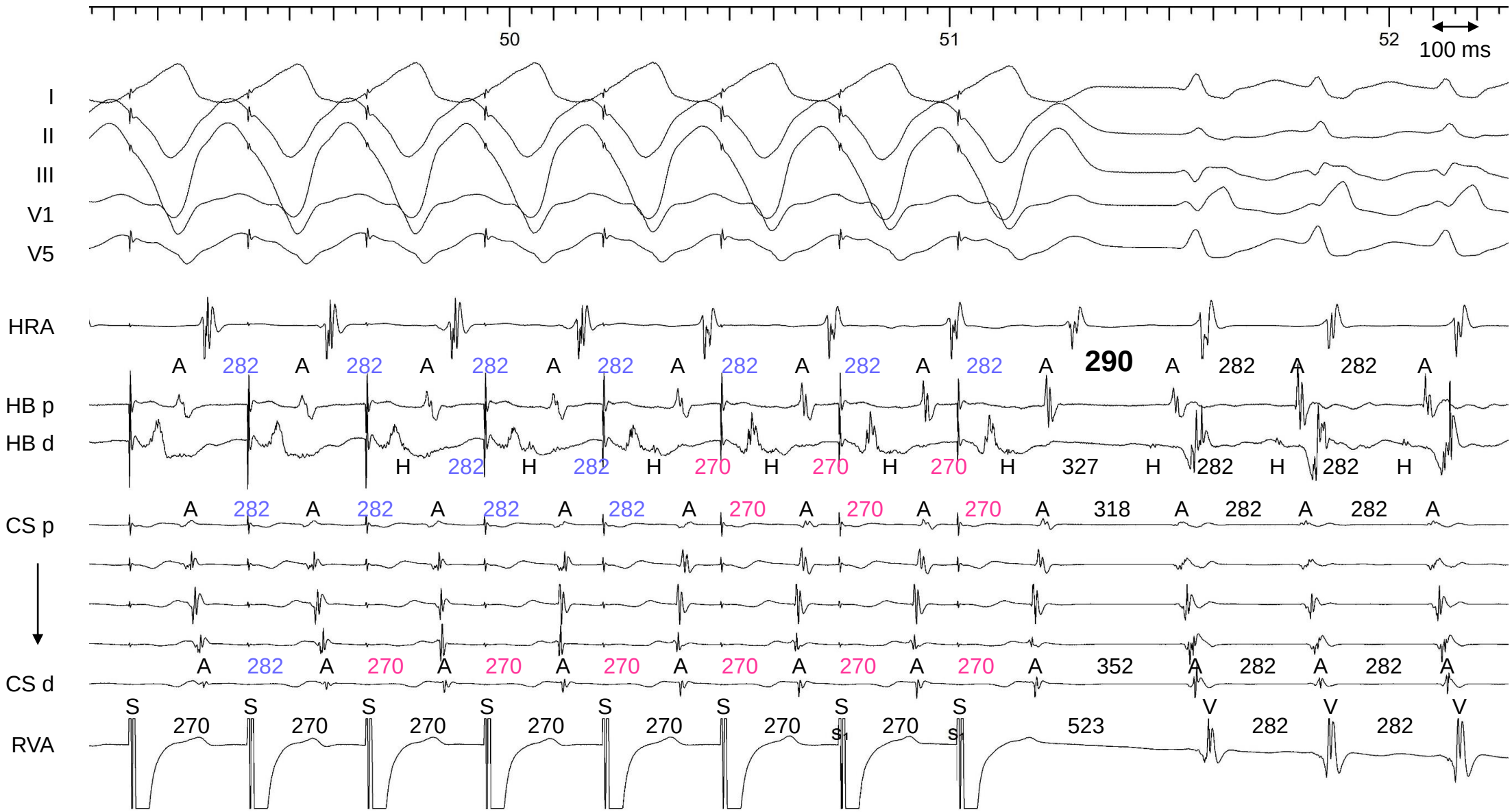
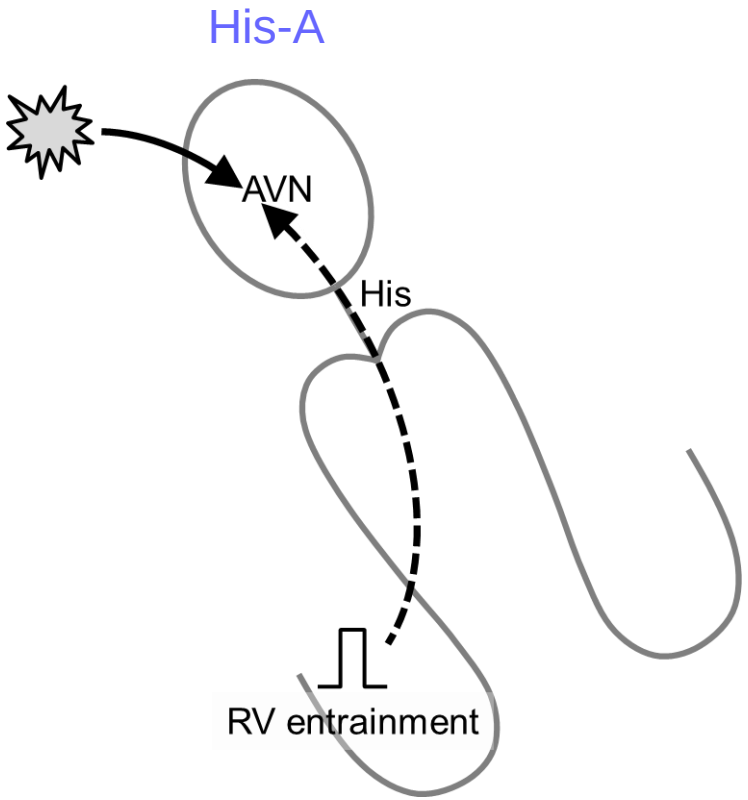
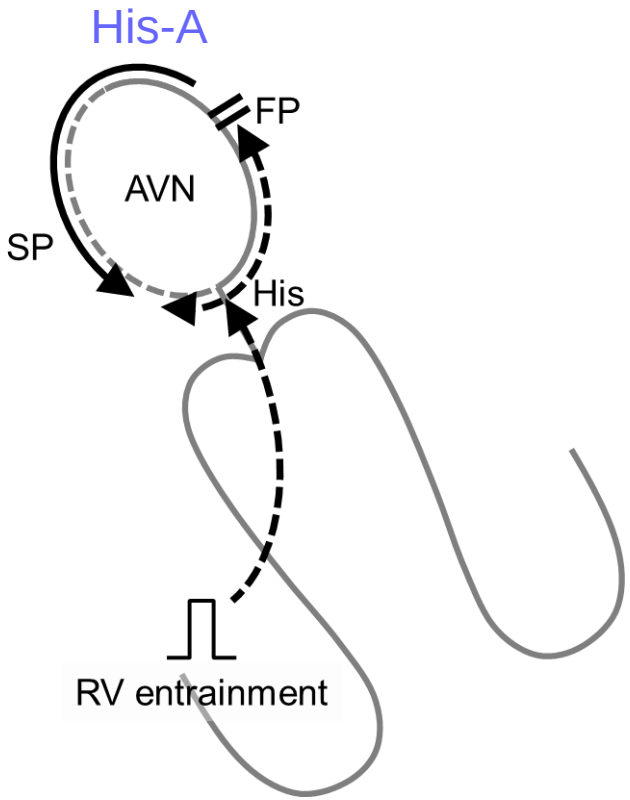


RV pacingはHis Aをcaptureしていない

頻拍とpacingのfusionはAVN内



AT



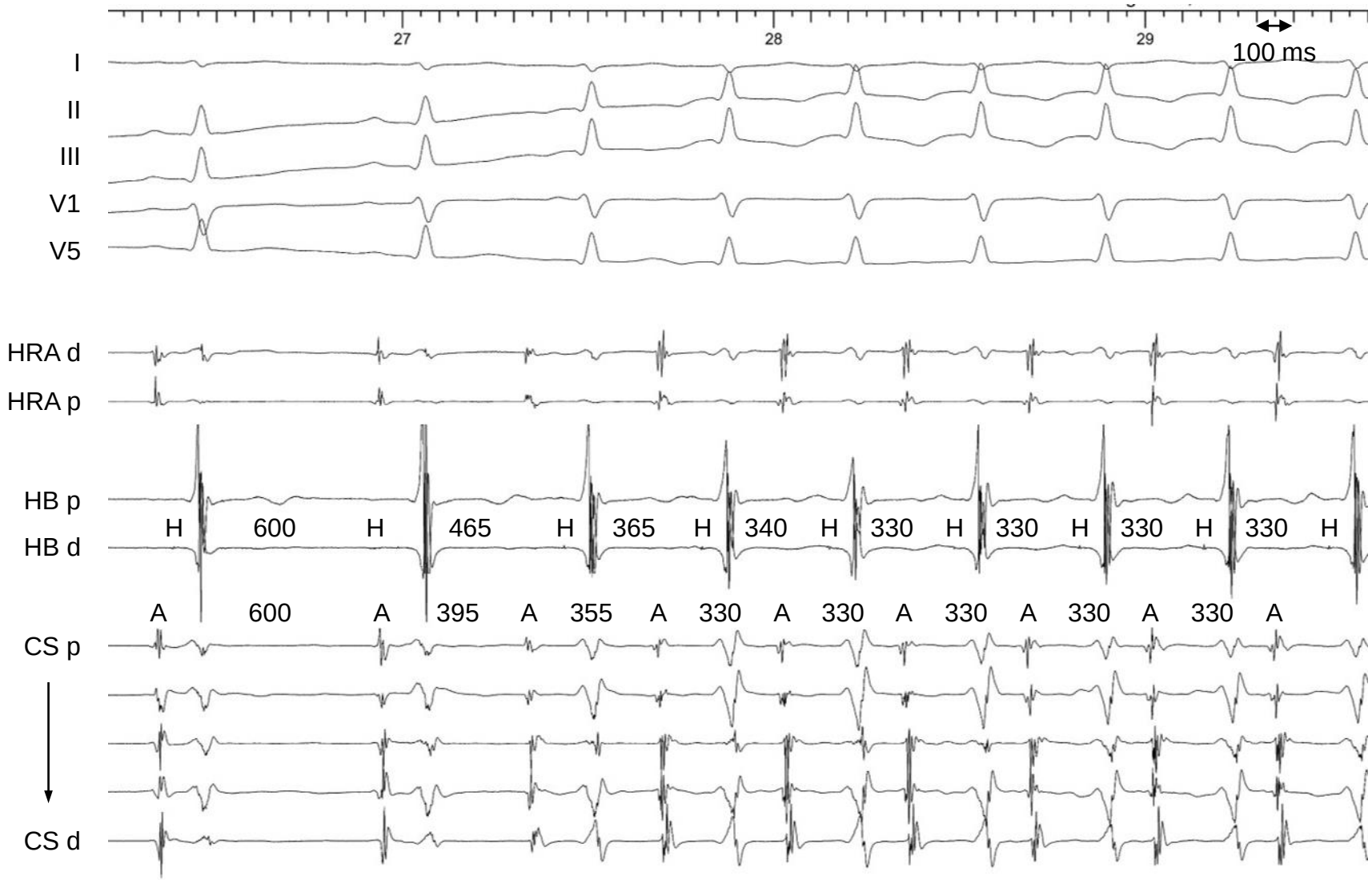
AVNRT

最終診断: One EGM-tracing tells all

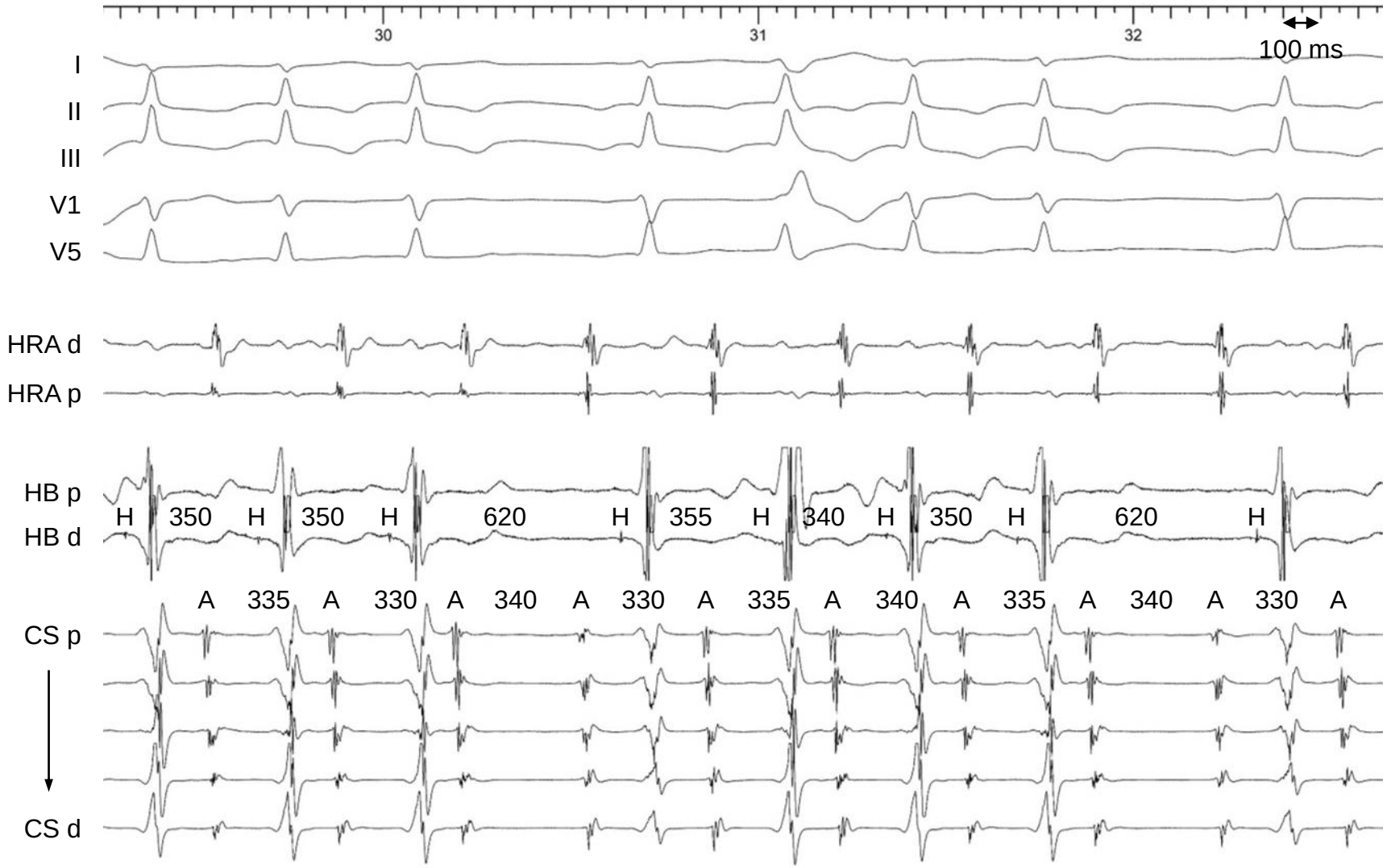
1. AT
2. ORT
3. AVNRT
4. AT + bystander left lateral AP
5. AVNRT + bystander left lateral AP

Hirata & Nagashima et al. JCE2021

Case 2: Old yet new PJRT



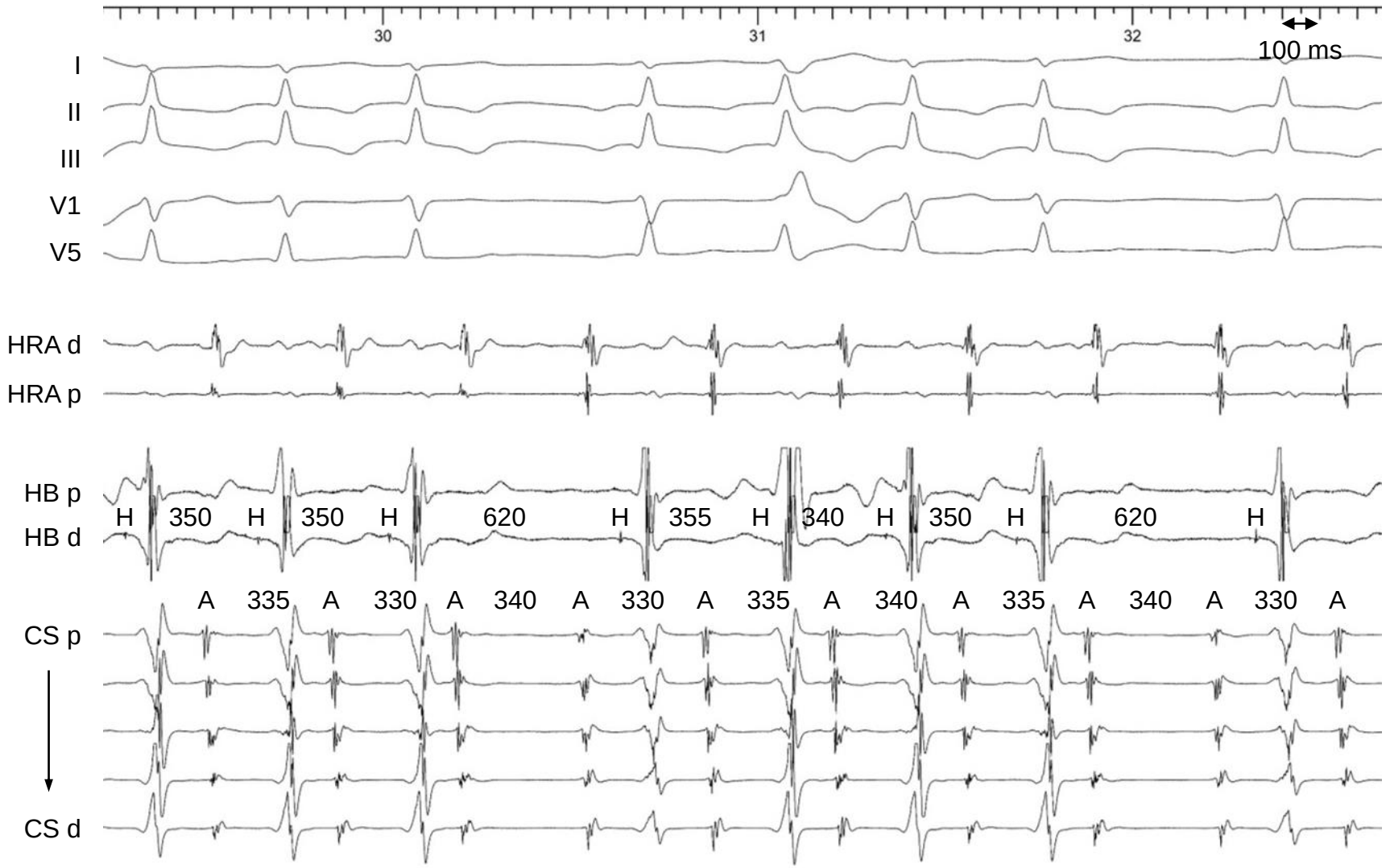
Case 2: Old yet new PJRT



Q2-1: 診断は？

1. AT
2. Atrioventricular ORT
3. Nodoventricular ORT
4. Nodofascicular ORT
5. AVNRT

Case 2: Old yet new PJRT



AV block → 心室筋は頻拍回路ではない

Q2-1: 診断は？

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2. Atrioventricular ORT
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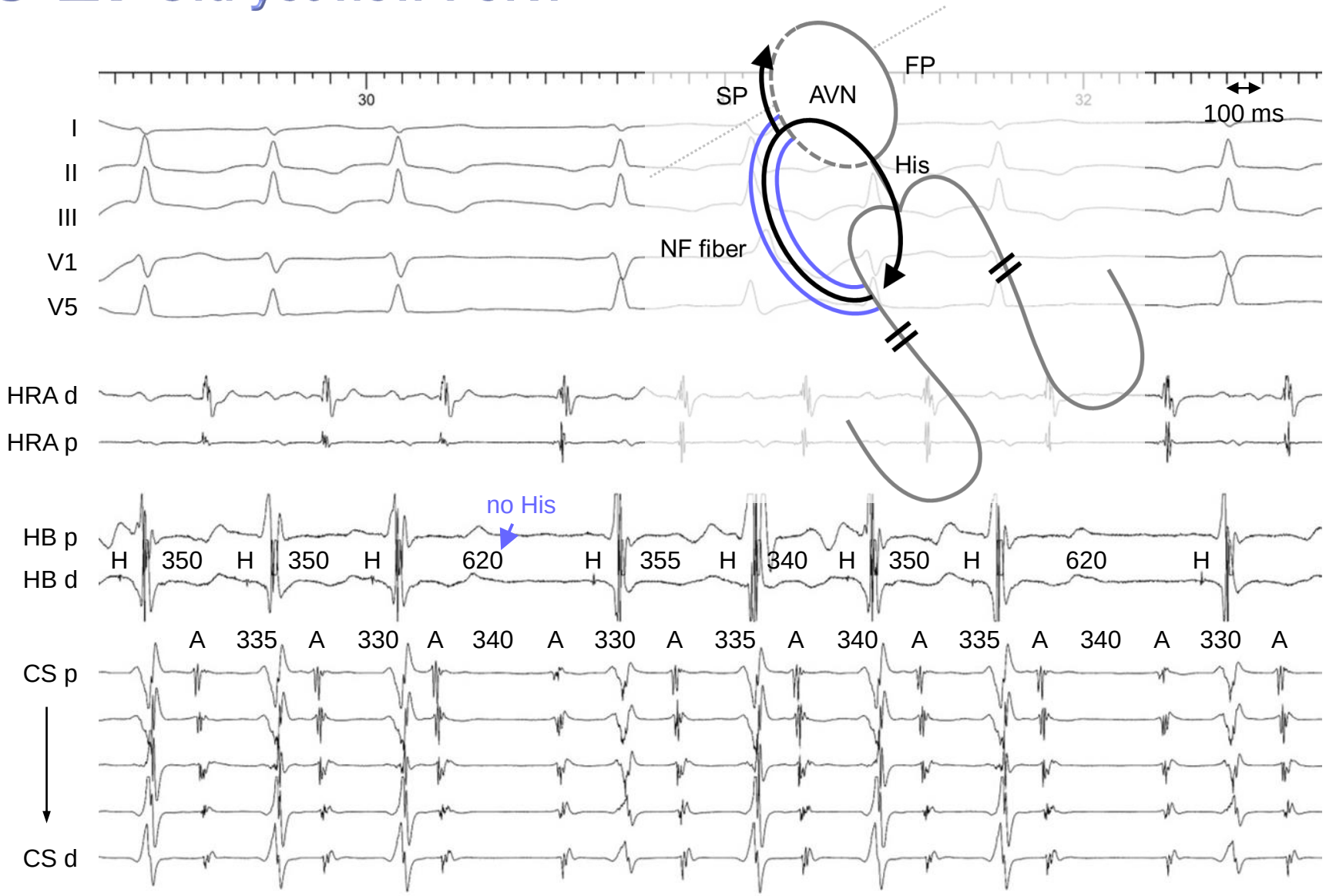
4. Nodofascicular ORT
5. AVNRT

Case 2: Old yet new PJRT

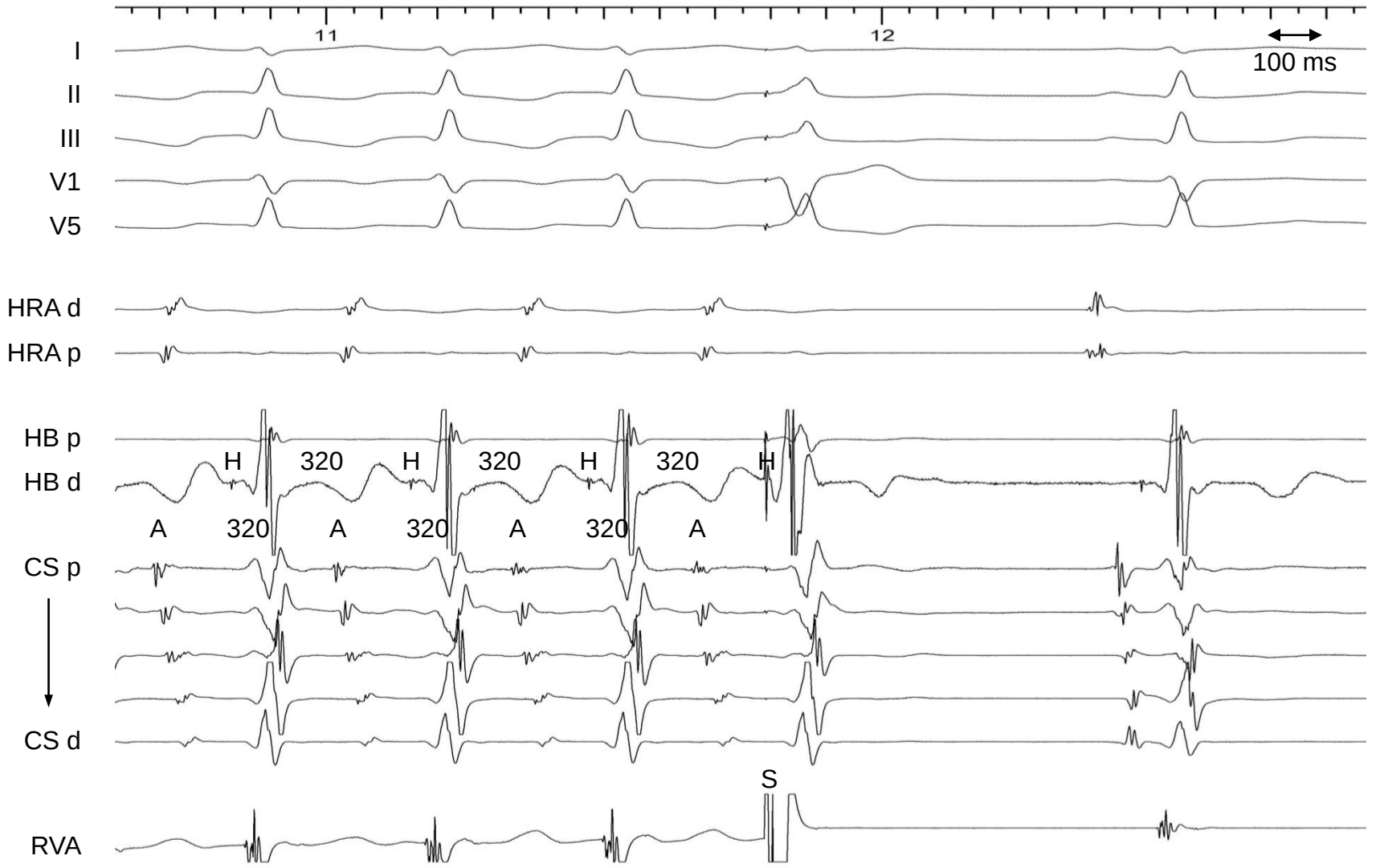


Q2-1: 診断は？

1. AT
2. Atrioventricular ORT
3. Nodoventricular ORT
4. Nodofascicular ORT
5. AVNRT

この鑑別にHis refractory PVCを入れてみた…

Case 2: Old yet new PJRT



Q2-2: 最終診断は？

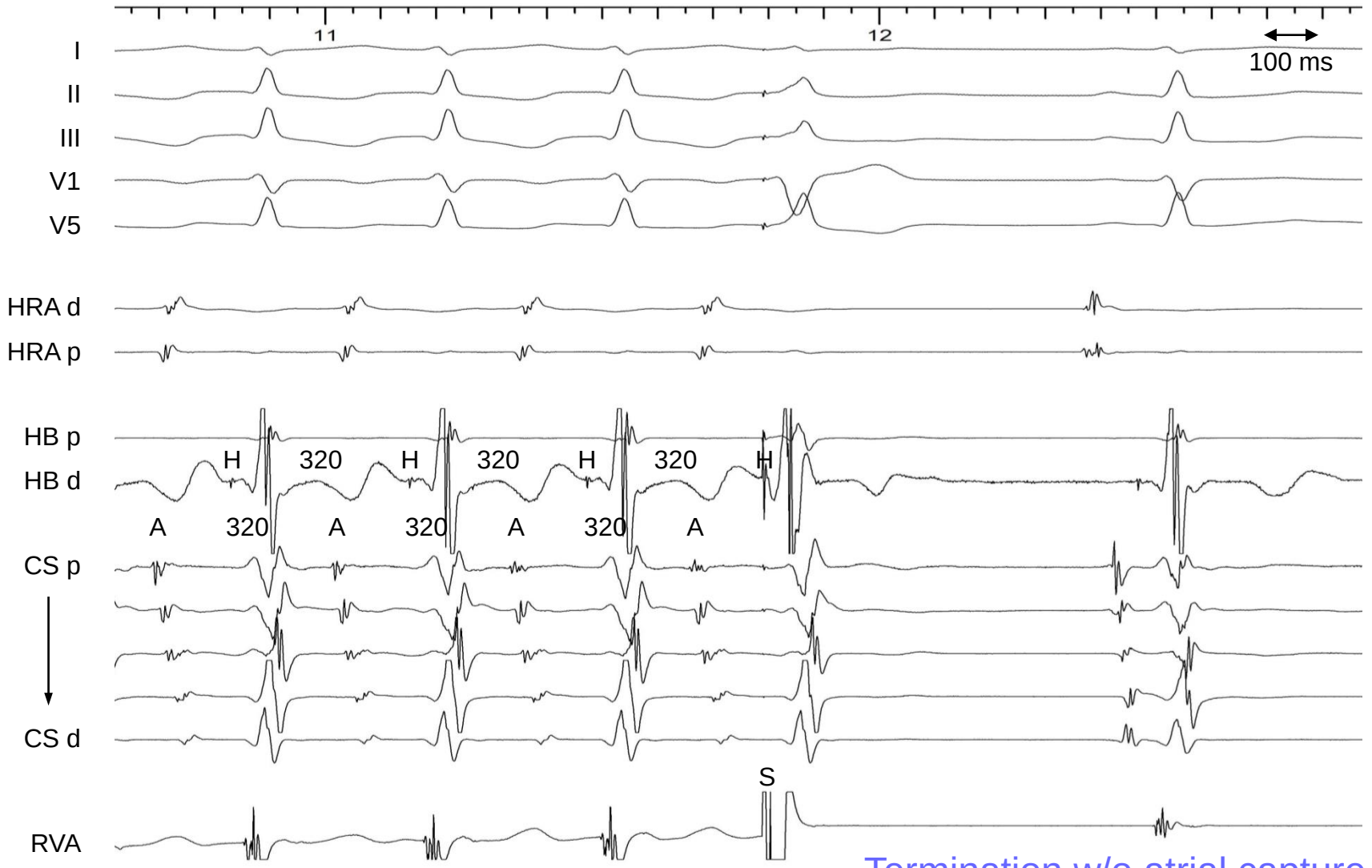
1. AT with bystander AV pathway

2. AT with bystander NV pathway

3. AVNRT with bystander AV pathway

4. AVNRT with bystander NV pathway

Case 2: Old yet new PJRT



Termination w/o atrial capture

Q2-2: 最終診断は？

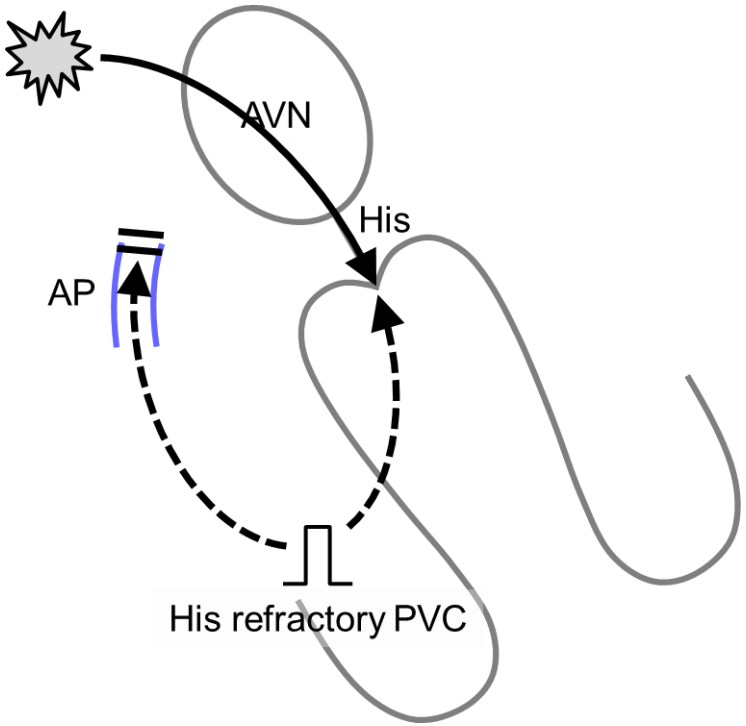
1. AT with bystander AV pathway

2. AT with bystander NV pathway

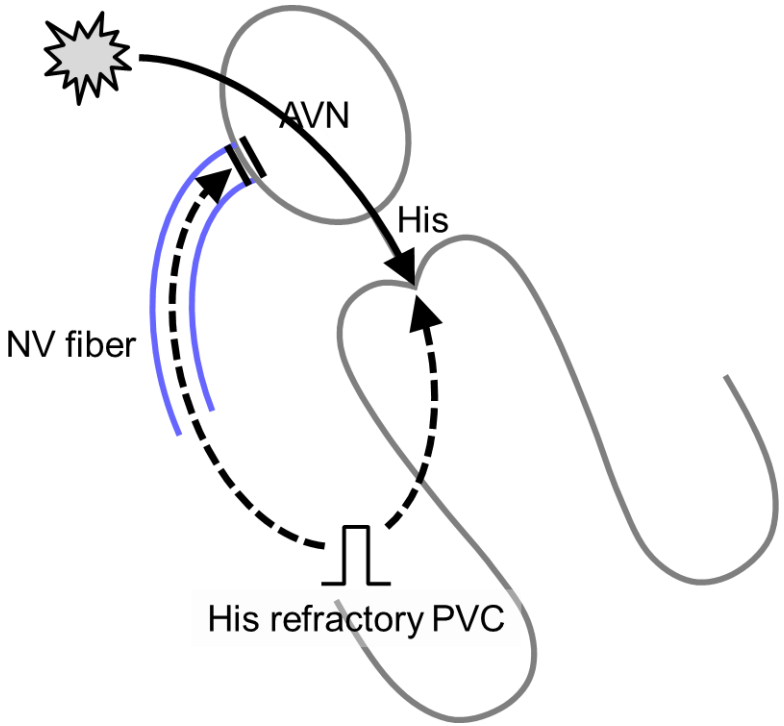
3. AVNRT with bystander AV pathway

4. AVNRT with bystander NV pathway

No termination



1. AT + AV pathway



2. AT + NV pathway

Q2-2: 最終診断は？

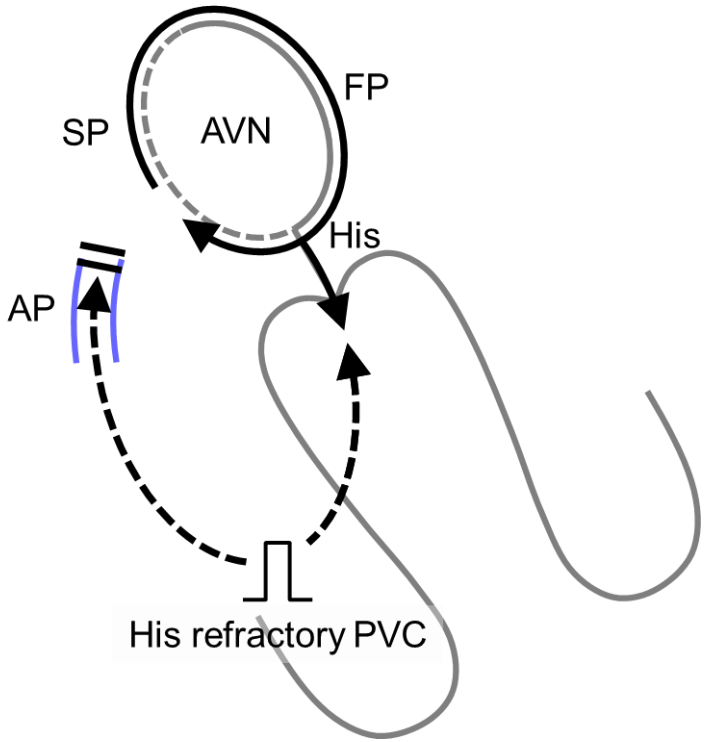
1. AT with bystander AV pathway

2. AT with bystander NV pathway

3. AVNRT with bystander AV pathway

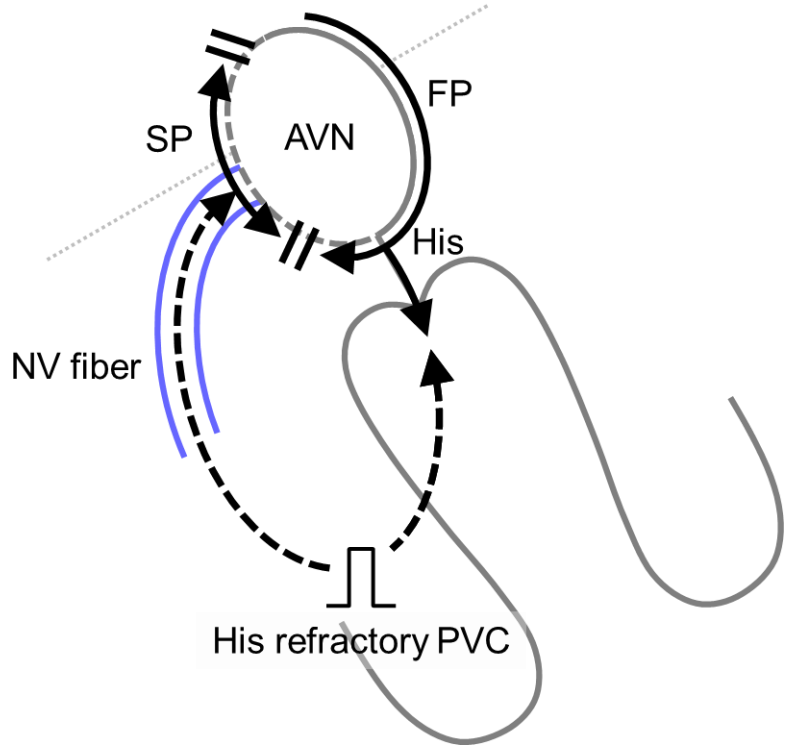
4. AVNRT with bystander NV pathway

No termination



3. AVNRT + AV pathway

Termination w/o A capture



4. AVNRT + NV pathway

Q2-2: 最終診断は？

1. AT with bystander AV pathway

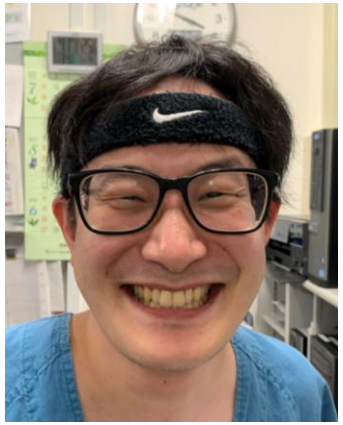
2. AT with bystander NV pathway

3. AVNRT with bystander AV pathway

4. AVNRT with bystander NV pathway

Permanent junctional reciprocating tachycardia

- 1967年, Coumelは, 機序をAVNRT (Junctional reciprocating)だと思い名付けた



- 1978年, Gallagherが, 減衰伝導するAV pathwayによるORTと報告

- この頻拍をCoumelへの敬意を込めて, “Old Yet New (古くて新しい)” PJRTと報告した

Otsuka & Nagashima et al. JCE2021

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CONFLICT OF INTEREST

Itsuro Morishima

None

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Case 3

この頻拍の回路は？

HCM, 6X才, 男性

心室頻拍

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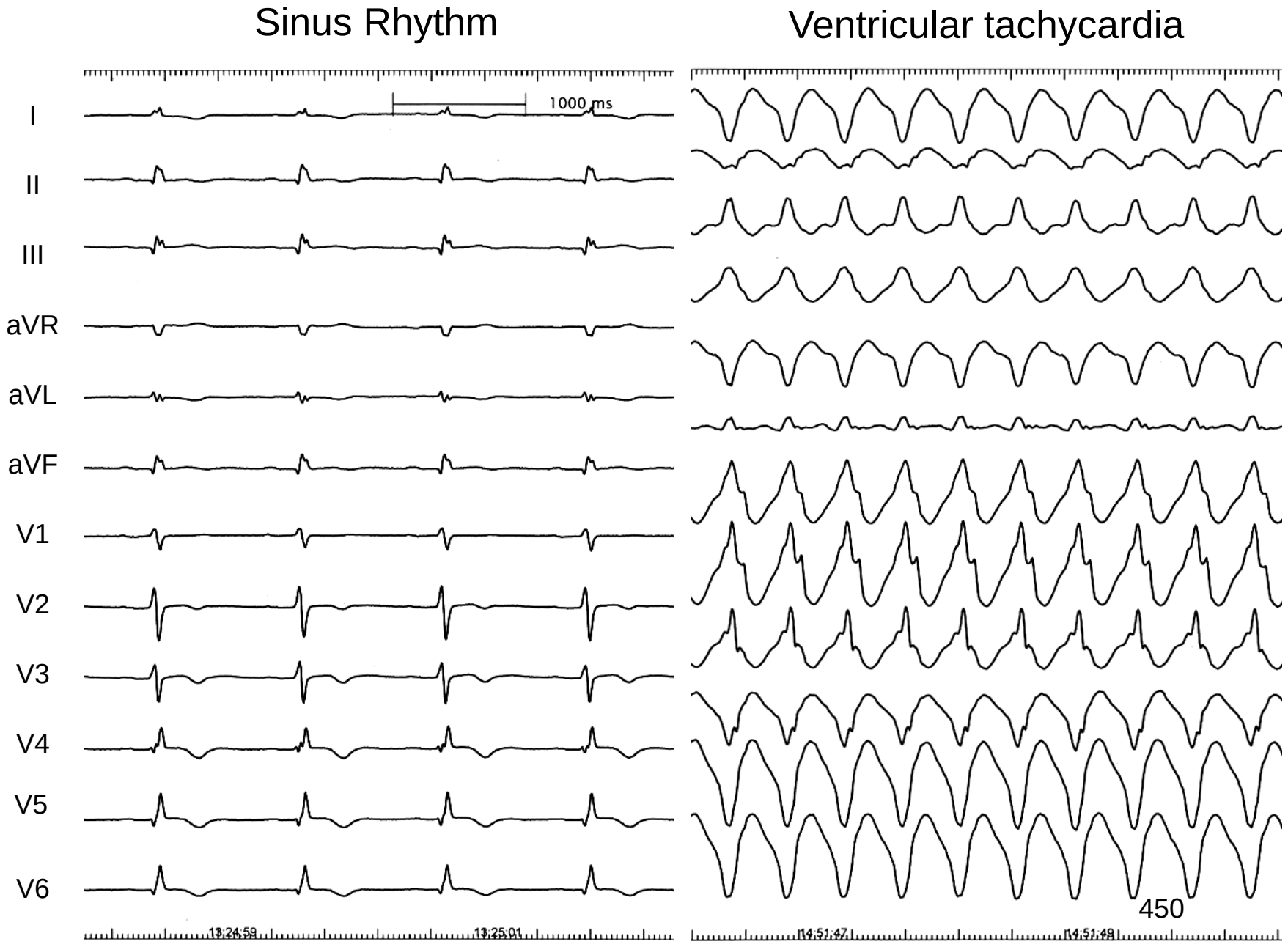
Case 3

HCM,
6X才，男性



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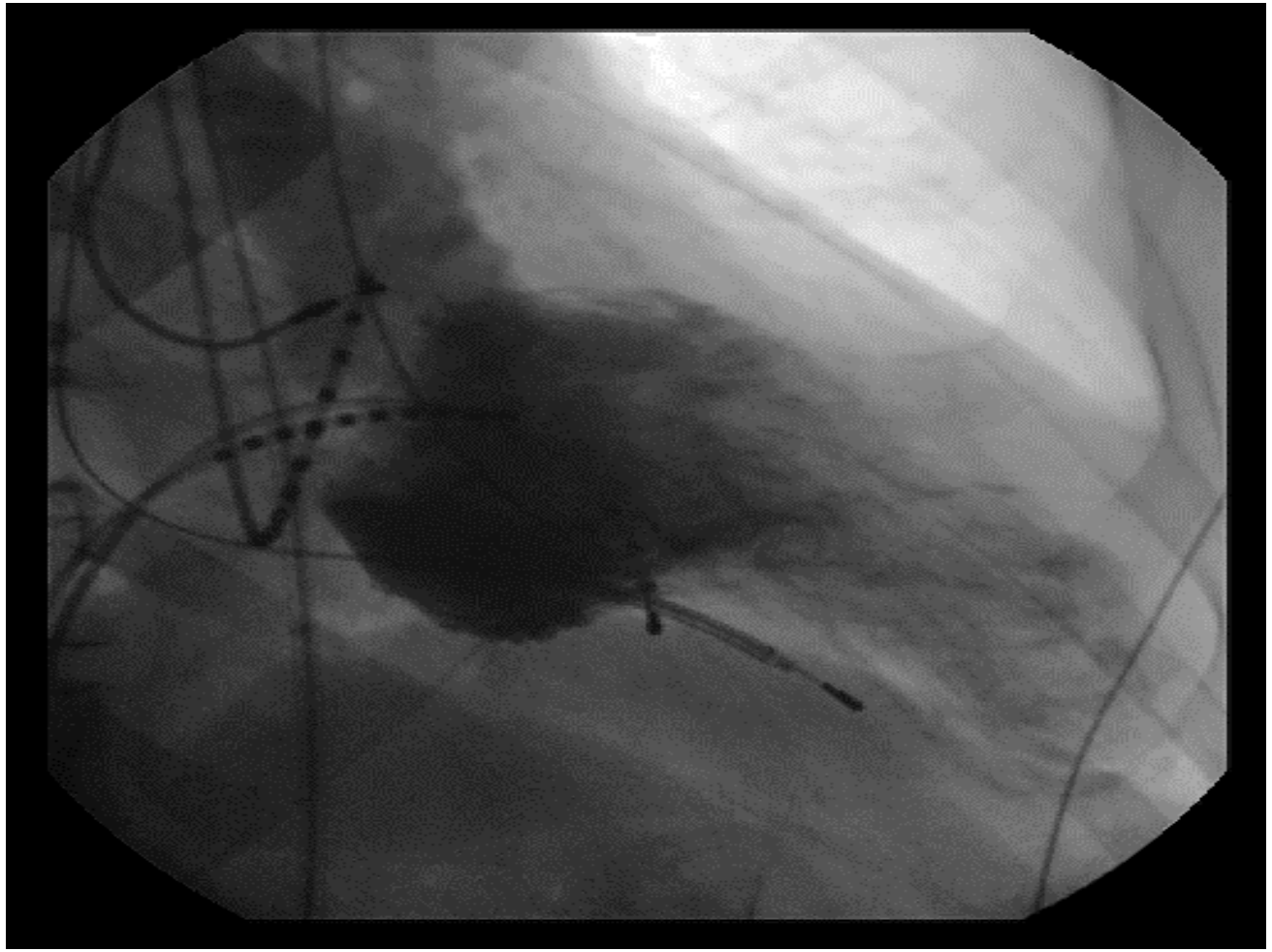
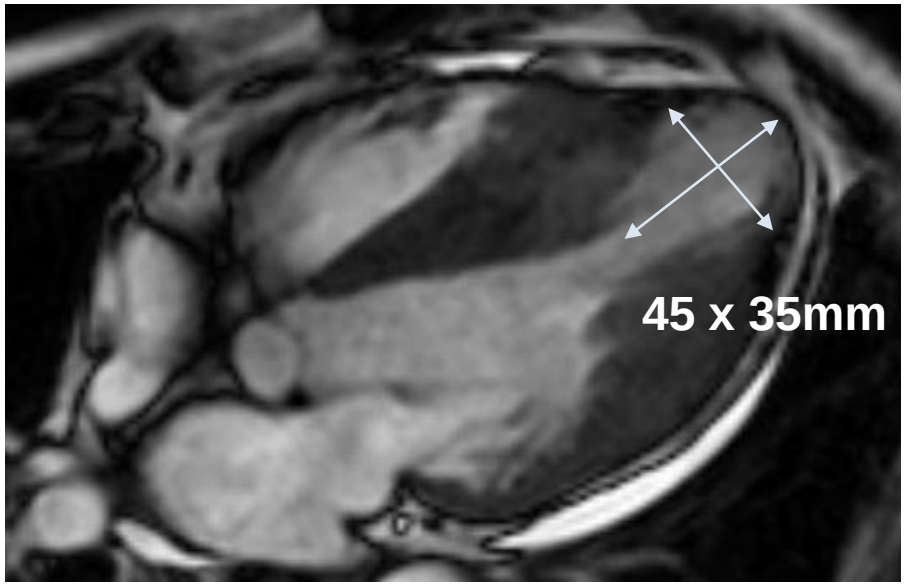
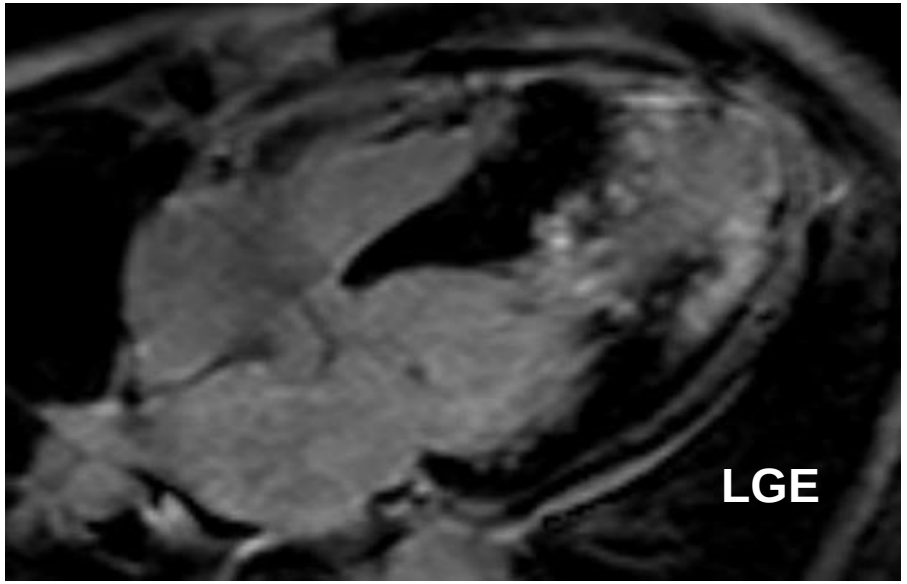
LV Apical Aneurysm

LVEF 57%







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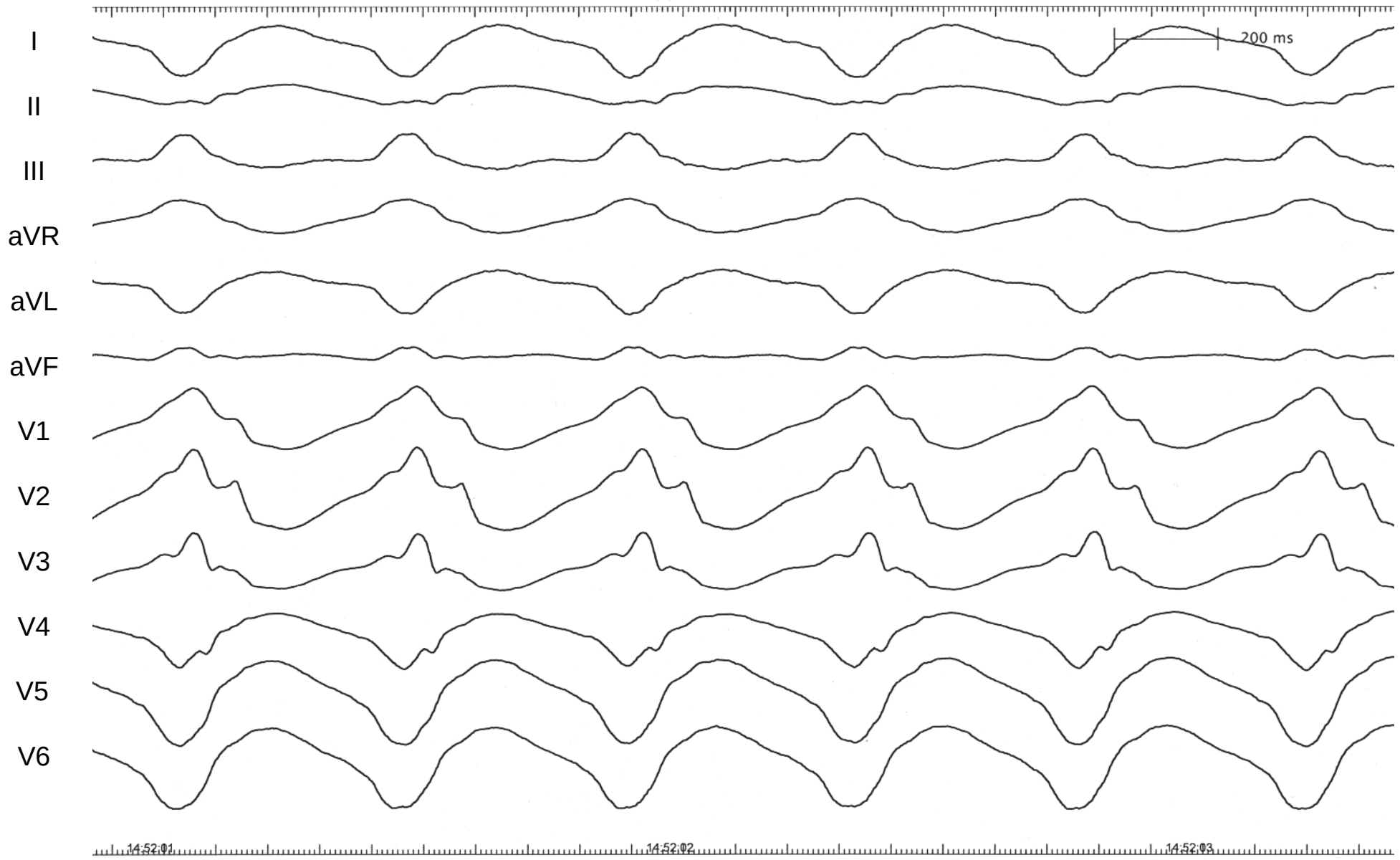
Ventricular Tachycardia



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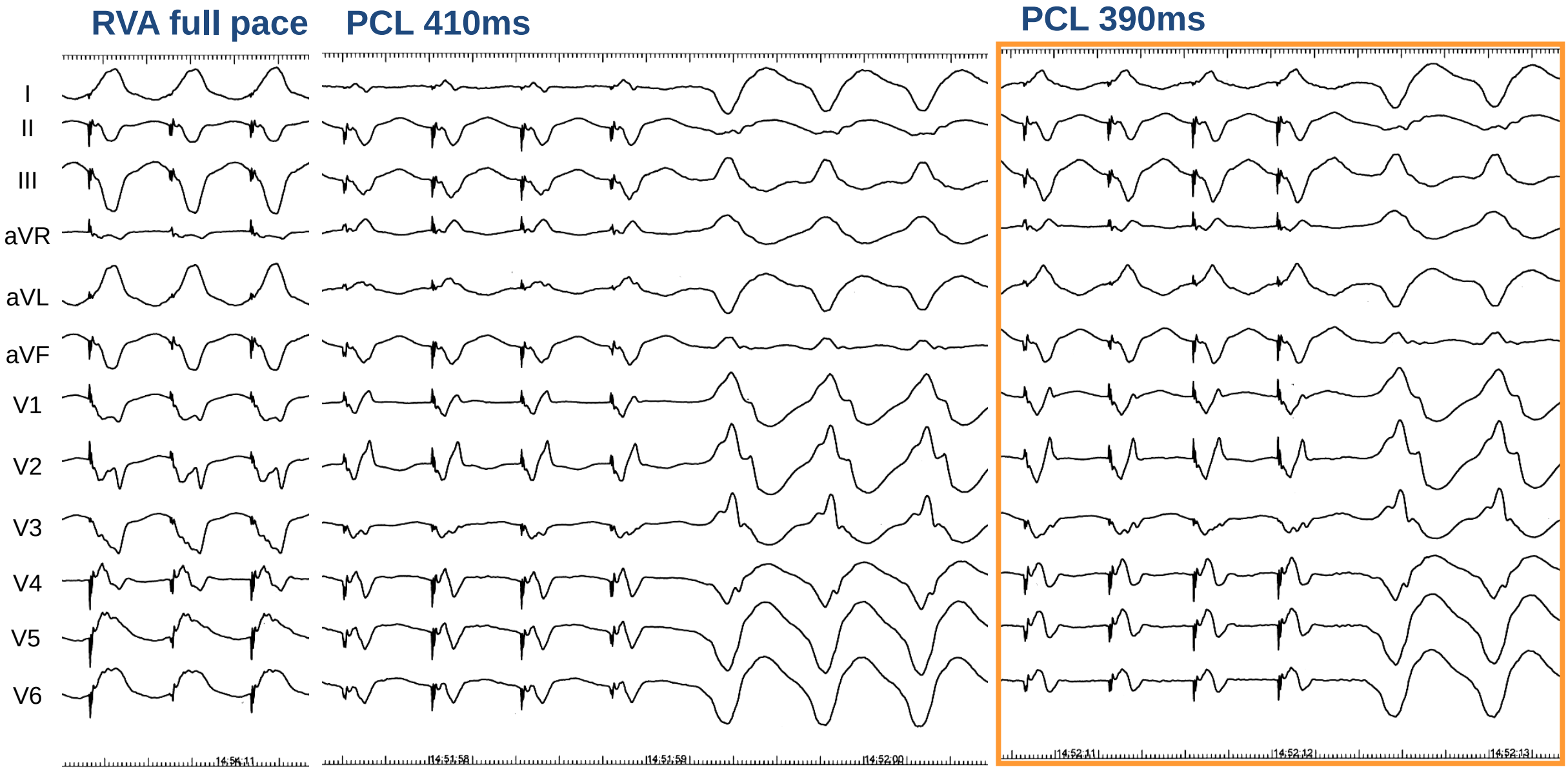
Over drive pacing from RVA during VT



Q3 - 1　VTのexitおよび機序で最も可能性の高いものは？

1. 左室心外膜側 リエントリー性 VT
2. 左室心内膜側 リエントリー性 VT
3. 左室心外膜側 非リエントリー性 VT
4. 左室心内膜側 非リエントリー性 VT
5. わかりません

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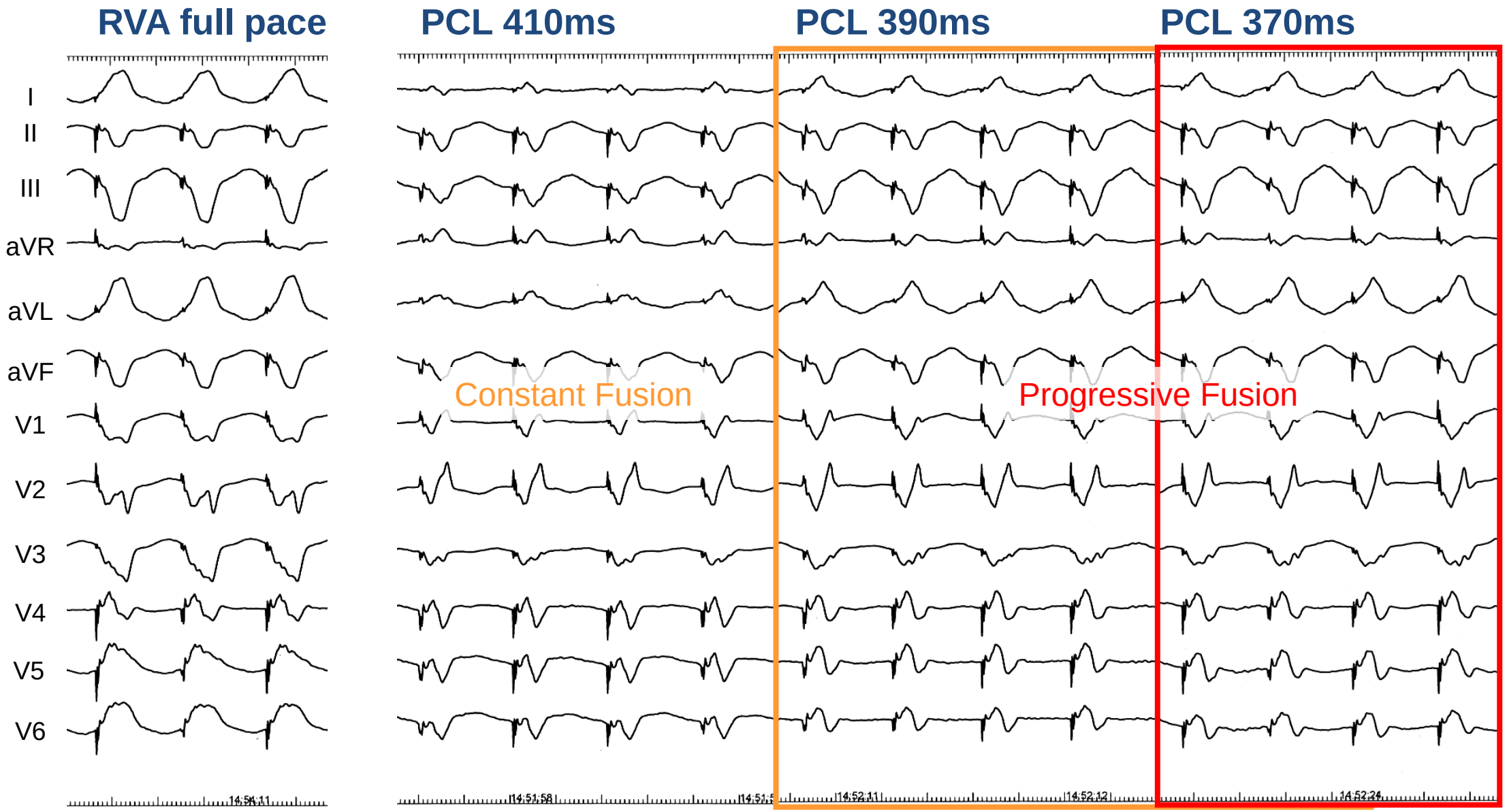

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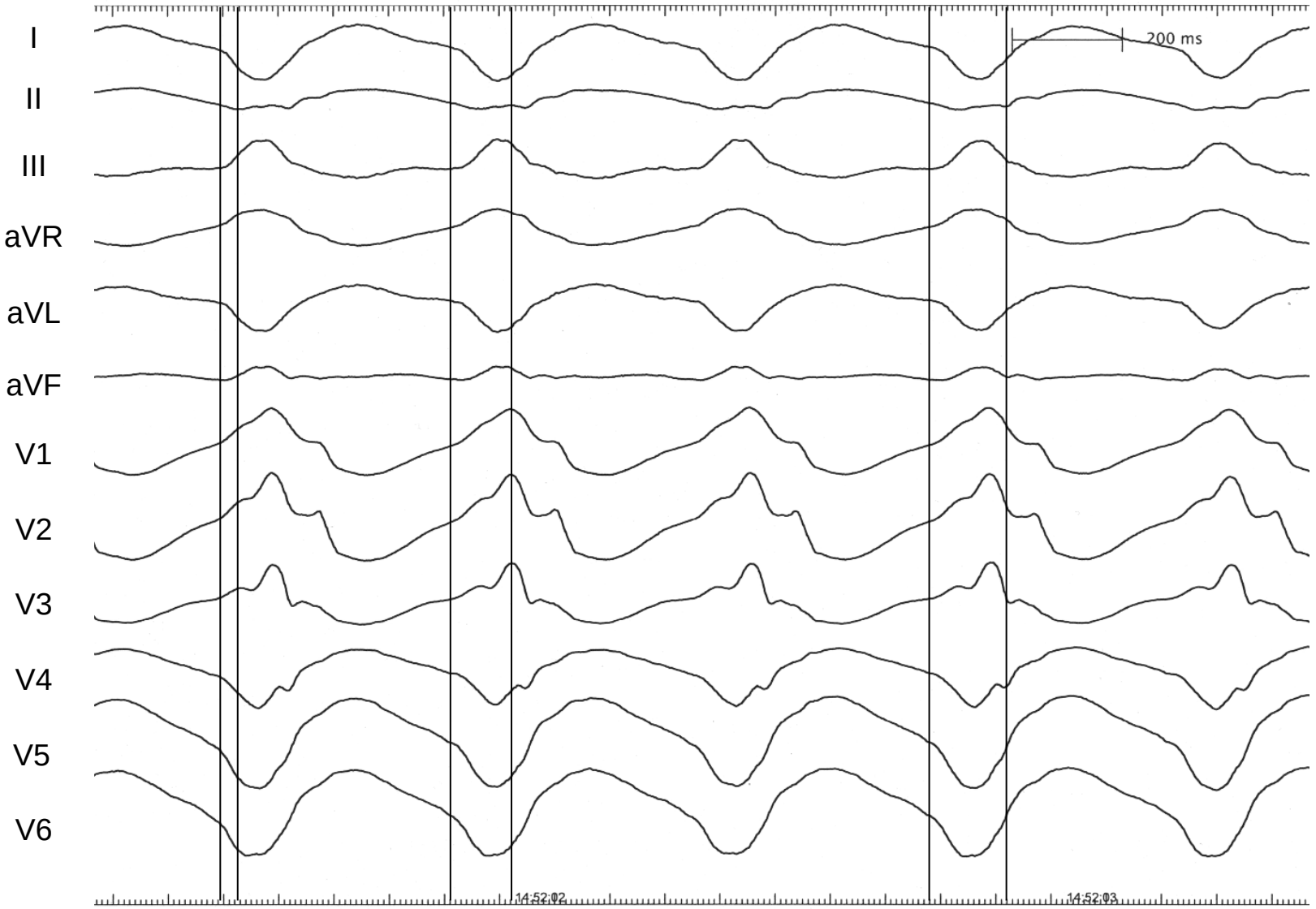
Ventricular Tachycardia



Pseudo-Delta Wave > 34ms

the earliest ventricular activation to the earliest fast deflection in any precordial lead

Intrinsicoid Deflection time > 85ms

the interval measured from the earliest ventricular activation to the peak of the R wave in V2.

Shortest RS duration > 121ms

the earliest ventricular activation to the nadir of the first S wave in any precordial lead

Berruezo A, et al. Circulation 2004;109:1842-1847.

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4. 左室心内膜側 非リエントリー性 VT
5. わかりません

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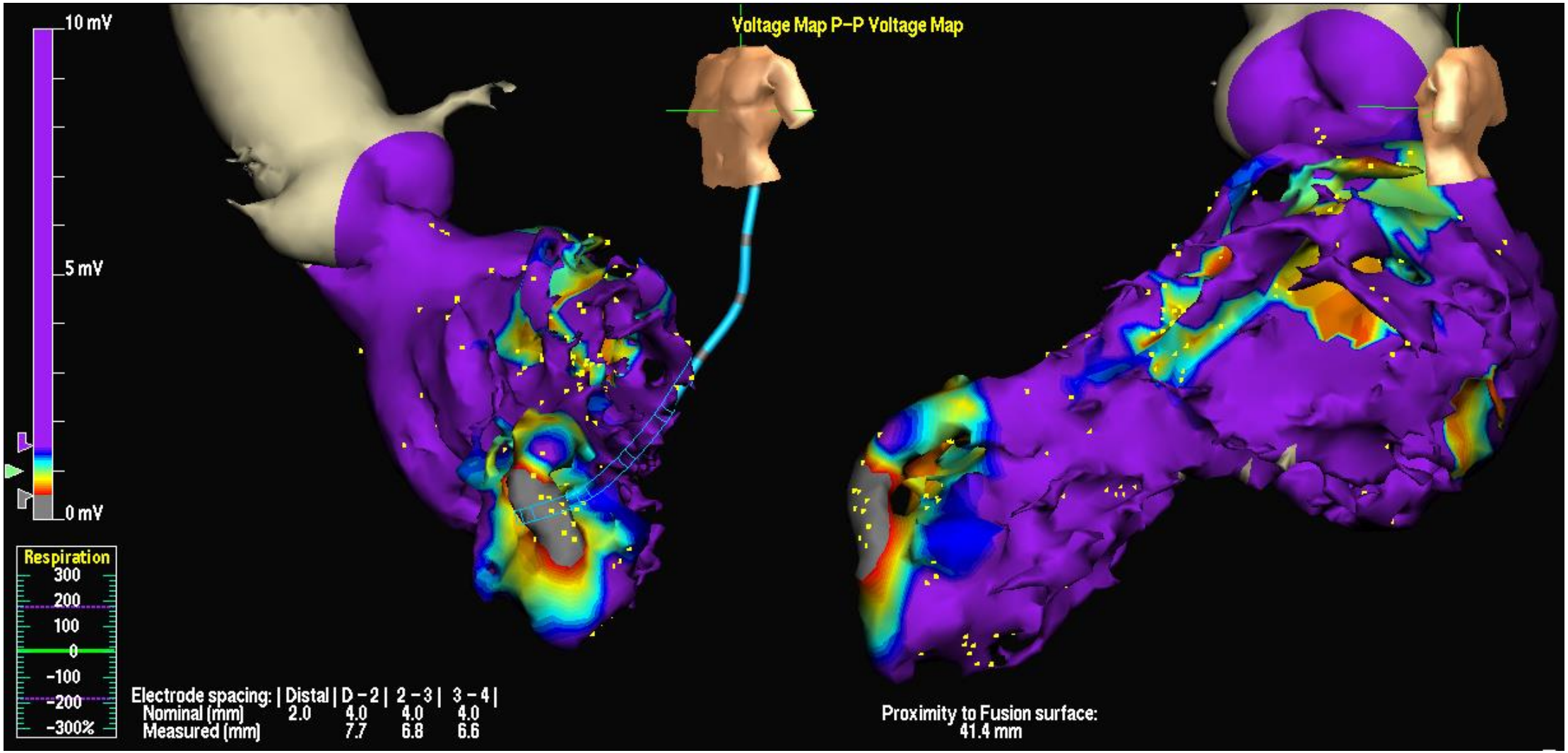
Bipolar Endocardial Voltage Map during SR



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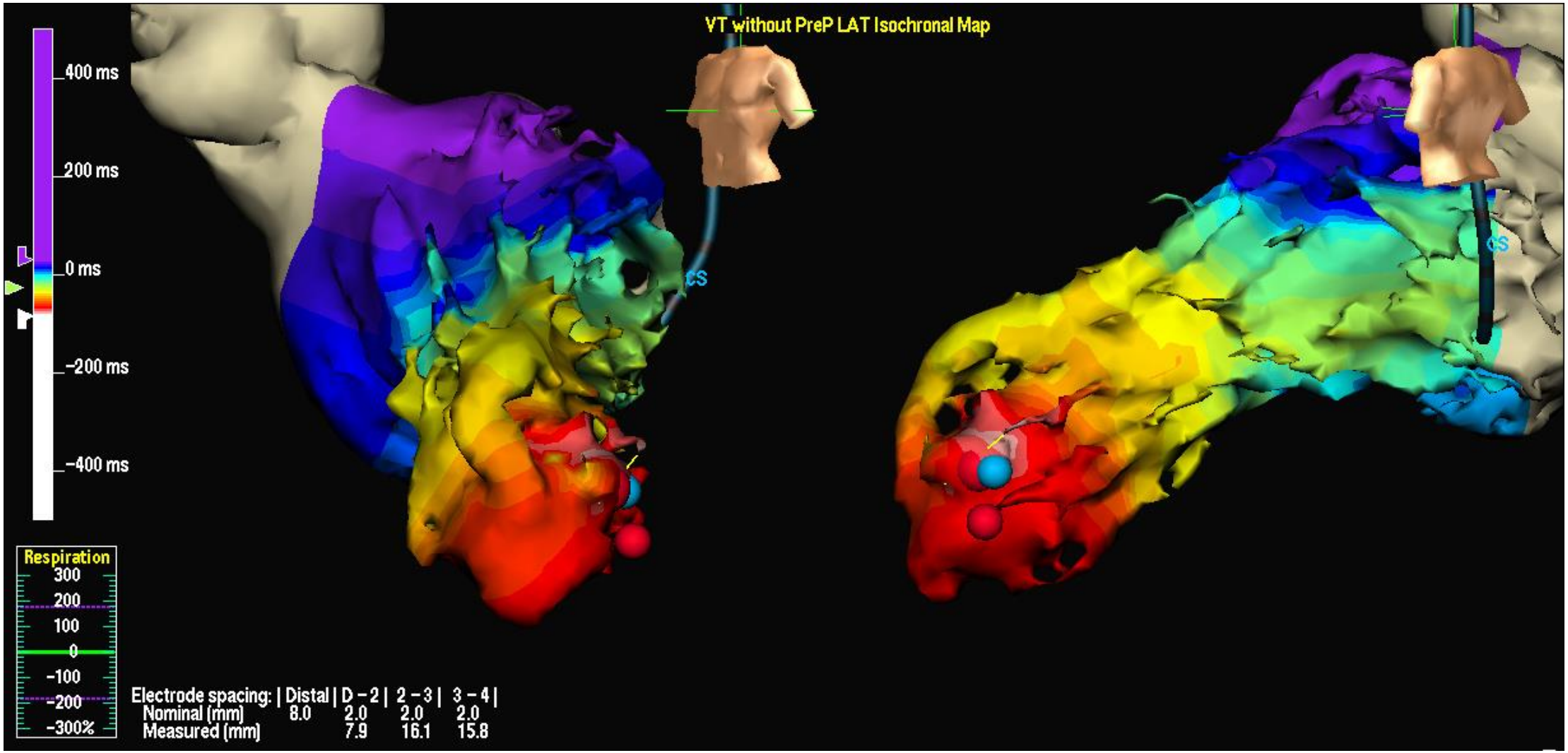
Endocardial Propagation during VT



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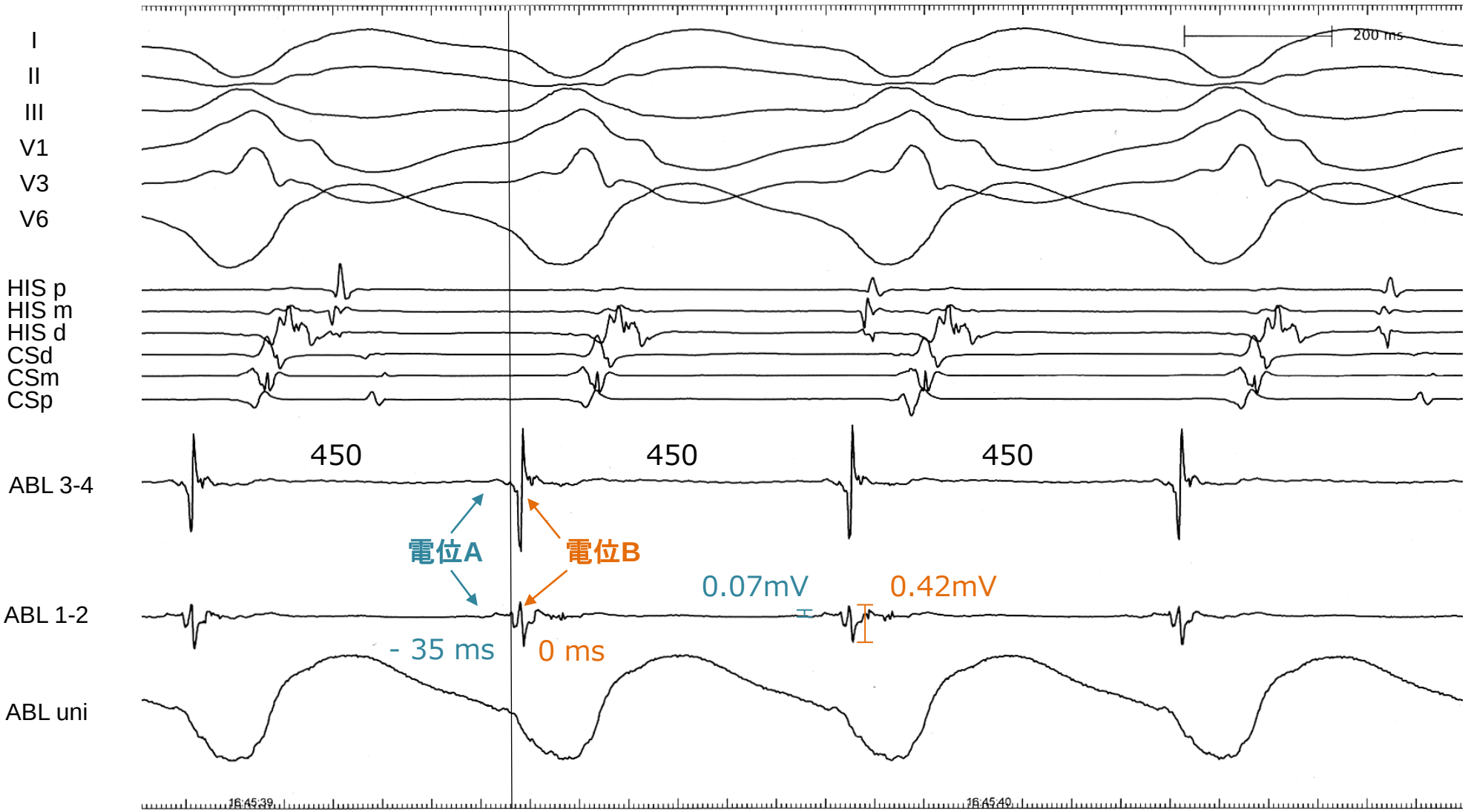
Site of the earliest activation within the aneurysm



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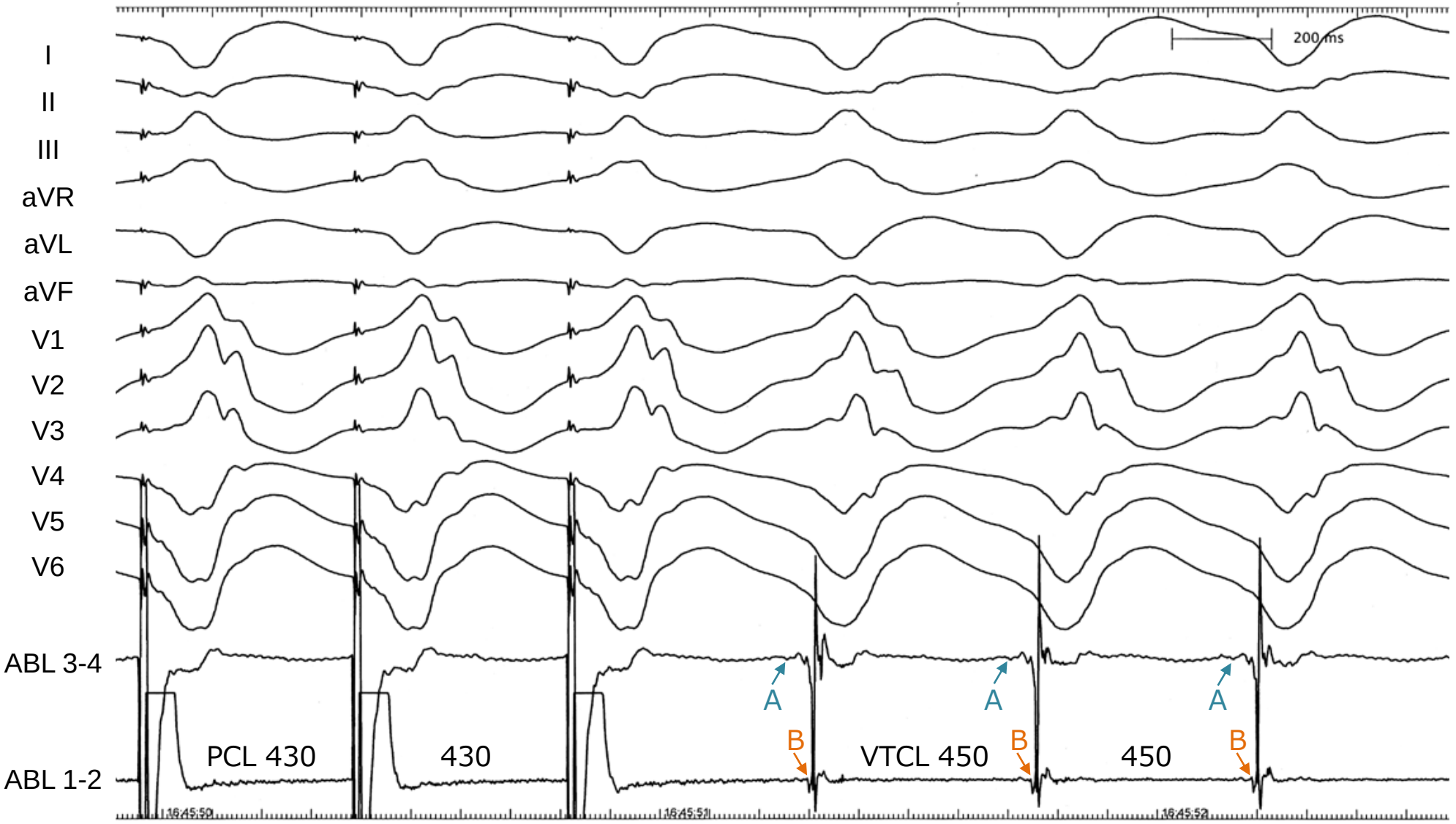
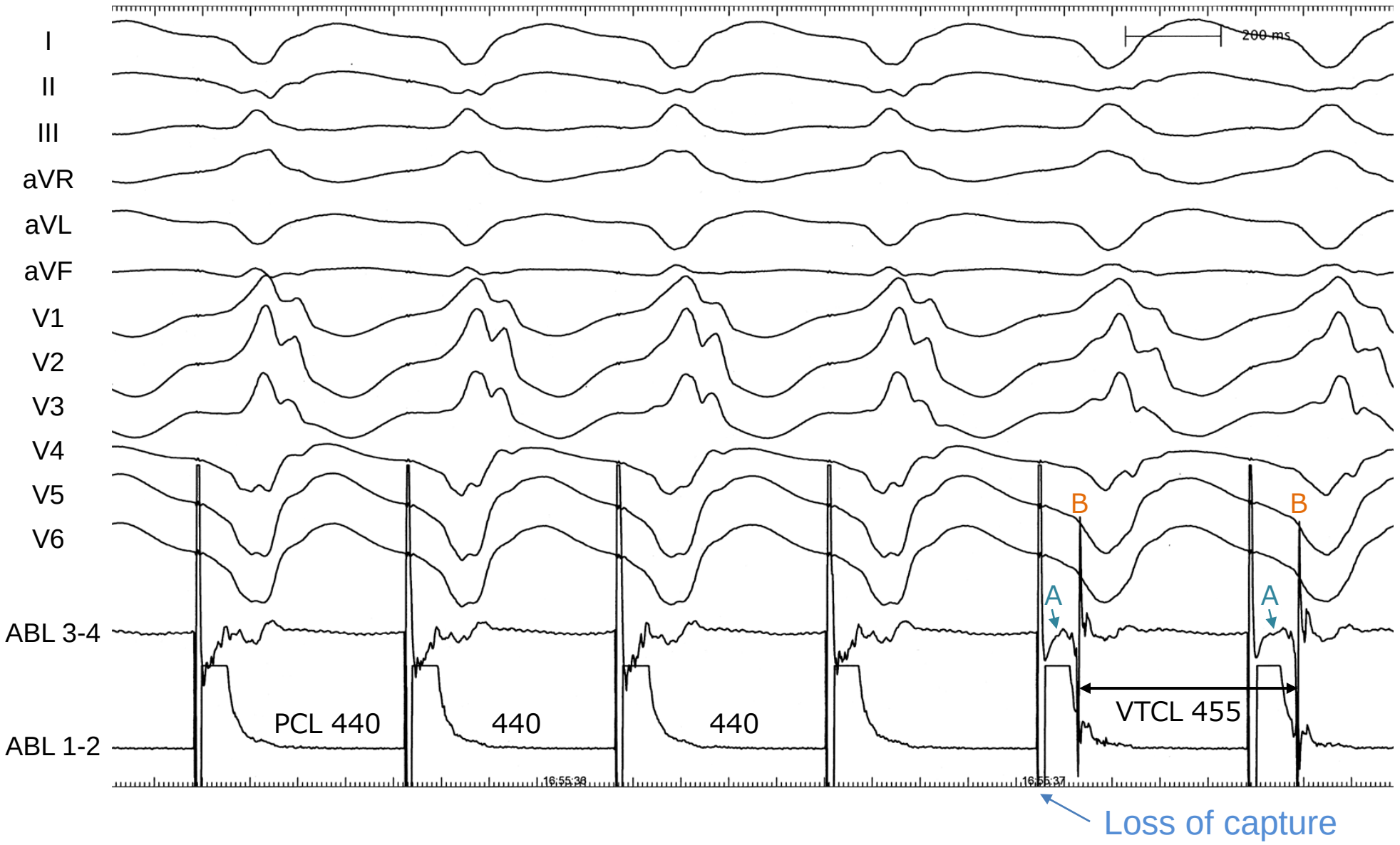
Entrainment Pacing 1: High Output Pacing



Entrainment Pacing 2: Low output pacing



Q3 - 2　最も確からしい2つの電位の解釈を選択してください。

1. 電位Aは回路上で電位Bも回路上
2. 電位Aは回路上で電位Bは回路外
3. 電位Aは回路外で電位Bは回路上
4. 電位Aは回路外で電位Bも回路外
5. わかりません

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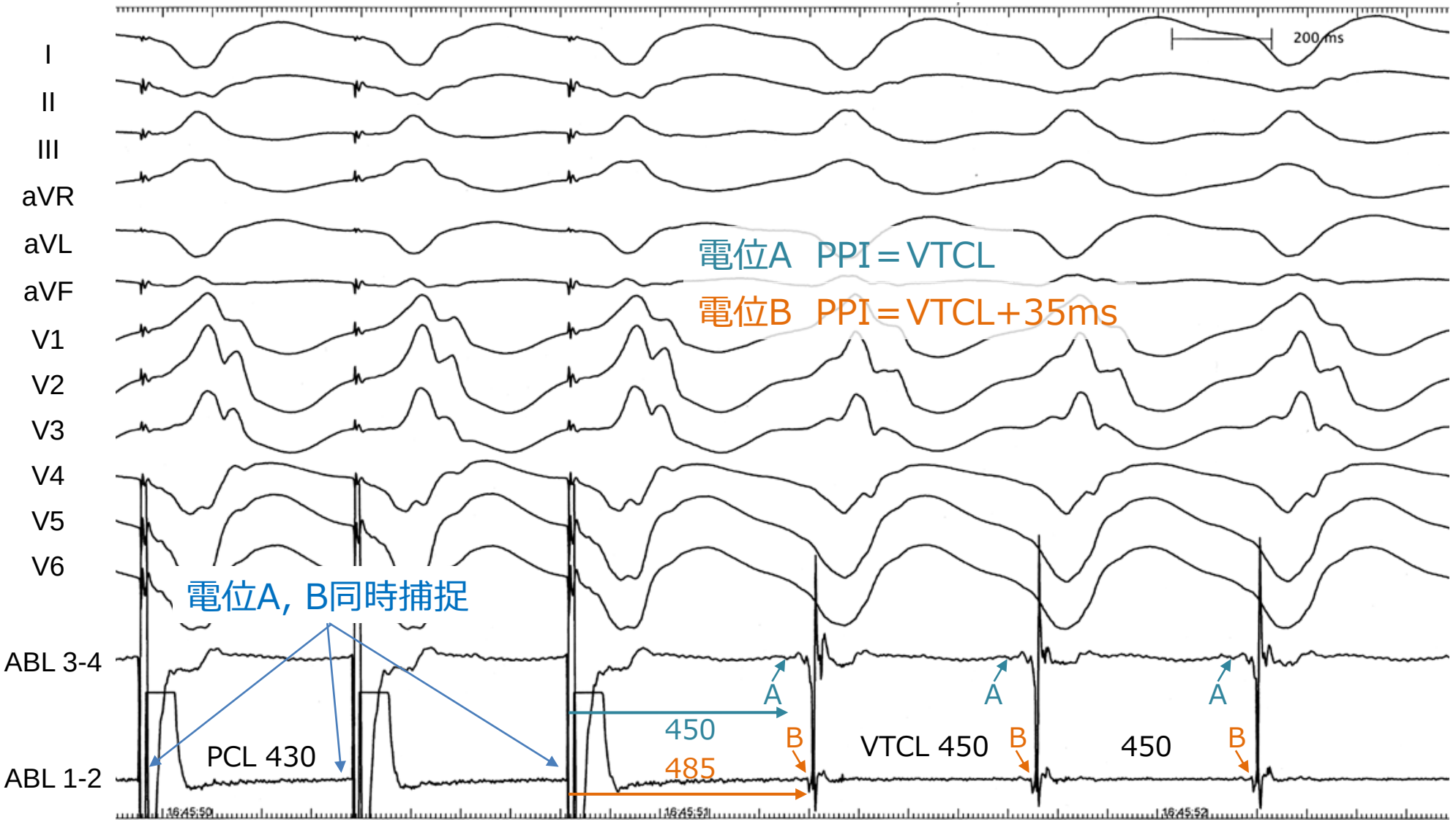
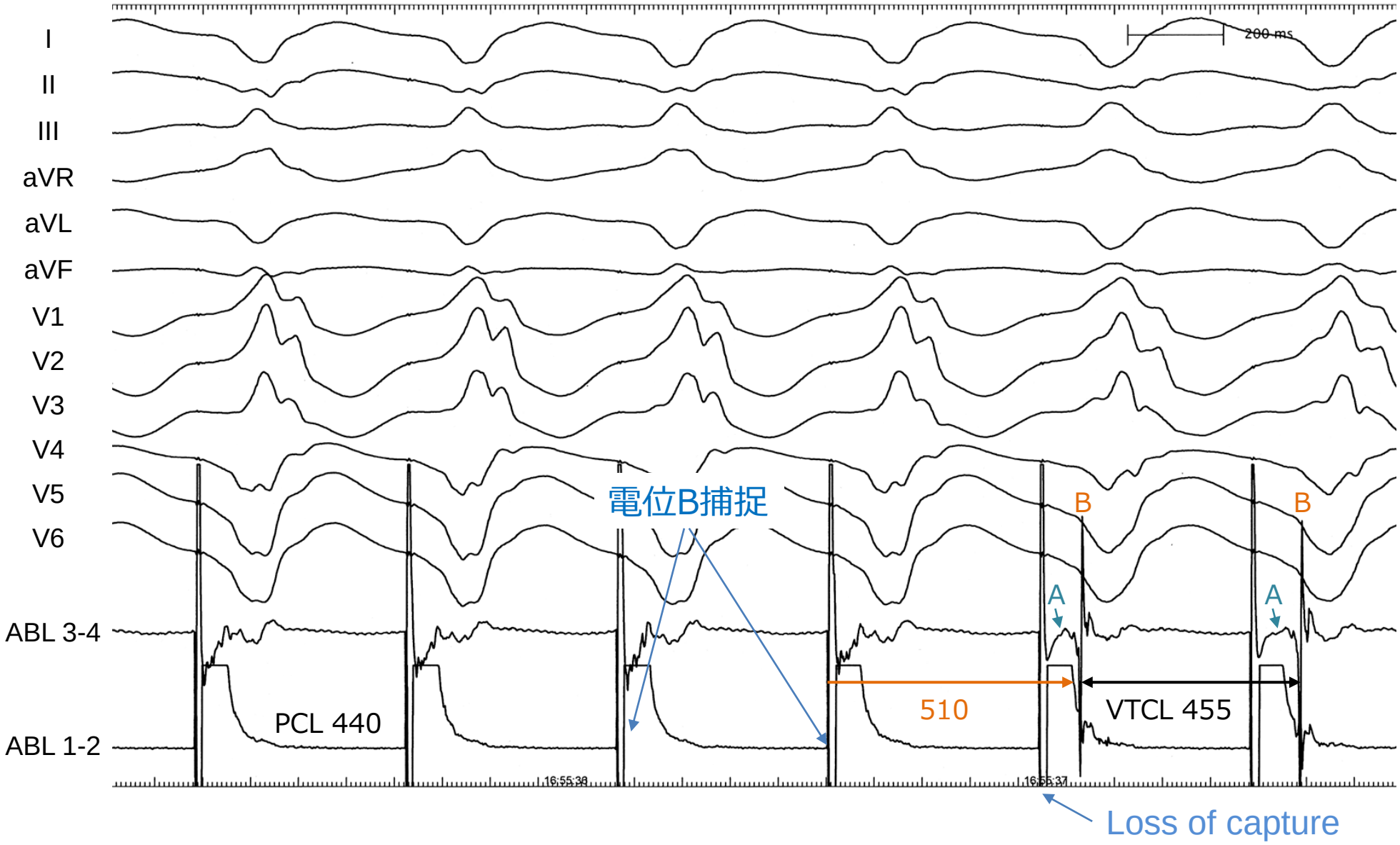
Entrainment Pacing 1: High Output Pacing



Entrainment Pacing 2: Low output pacing



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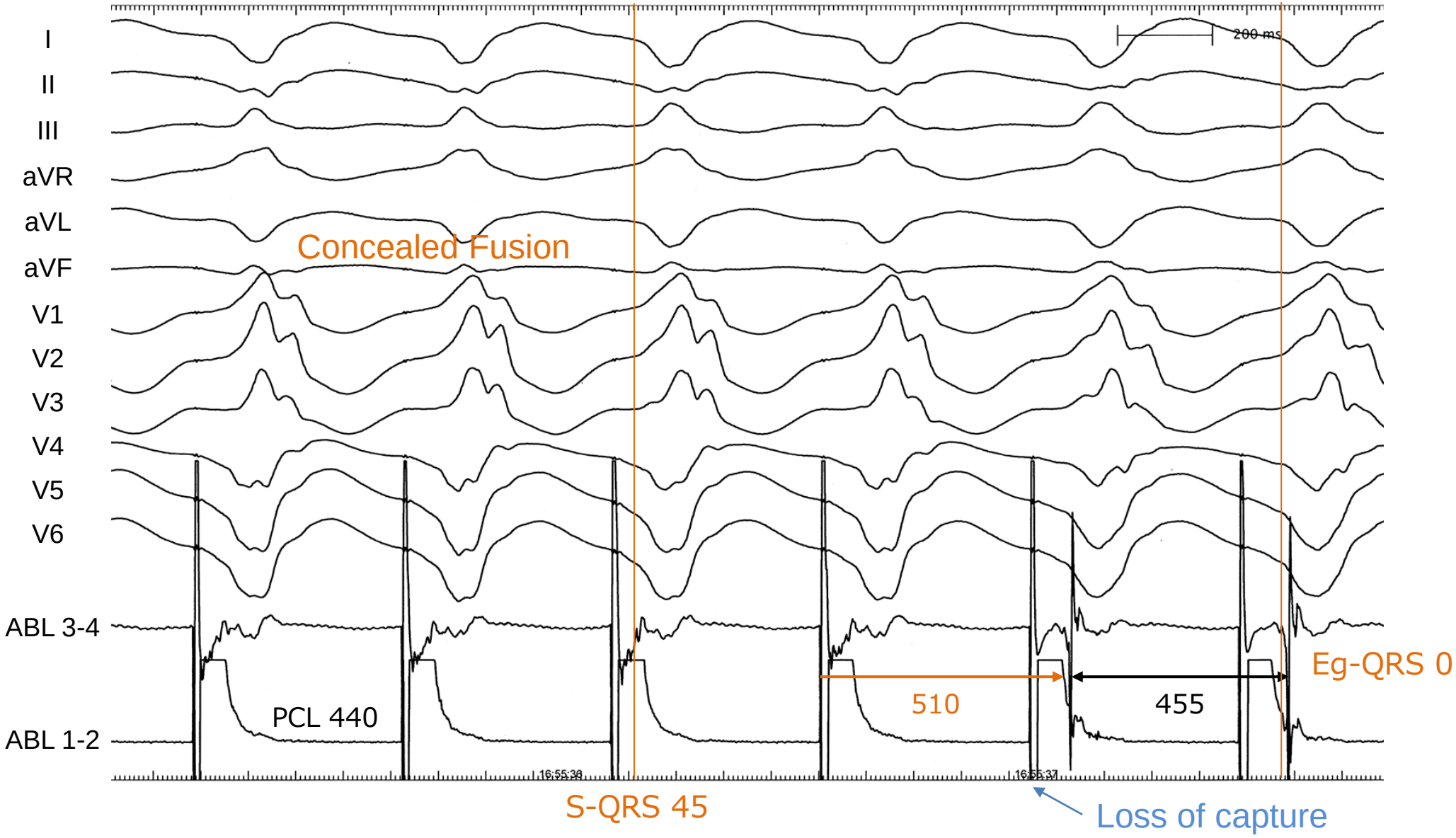
3. 電位Aは回路外で電位Bは回路上
4. 電位Aは回路外で電位Bも回路外
5. わかりません

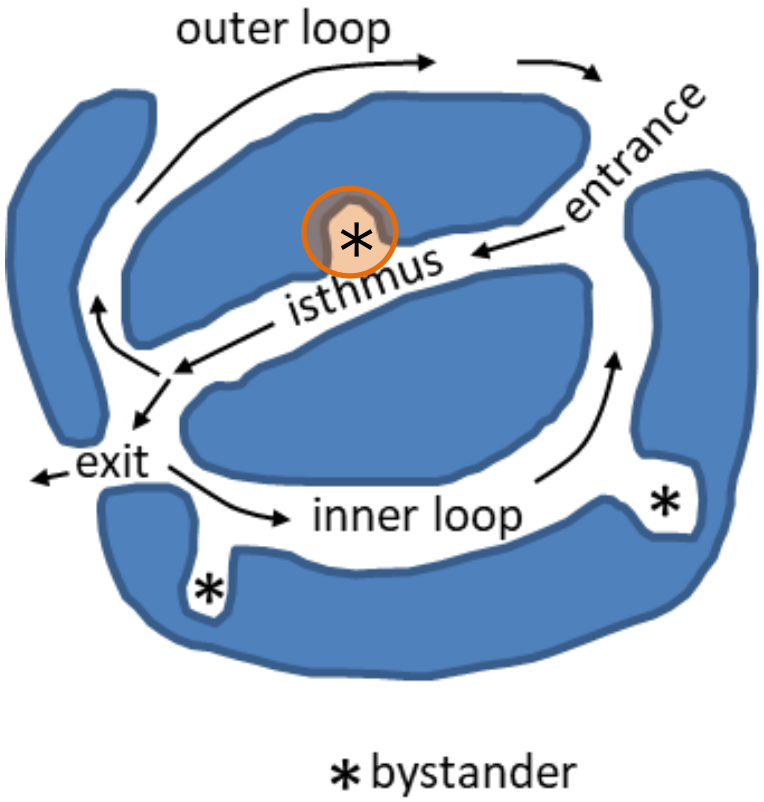
Q3 - 3　電位Bは次のどこを反映する電位でしょうか？

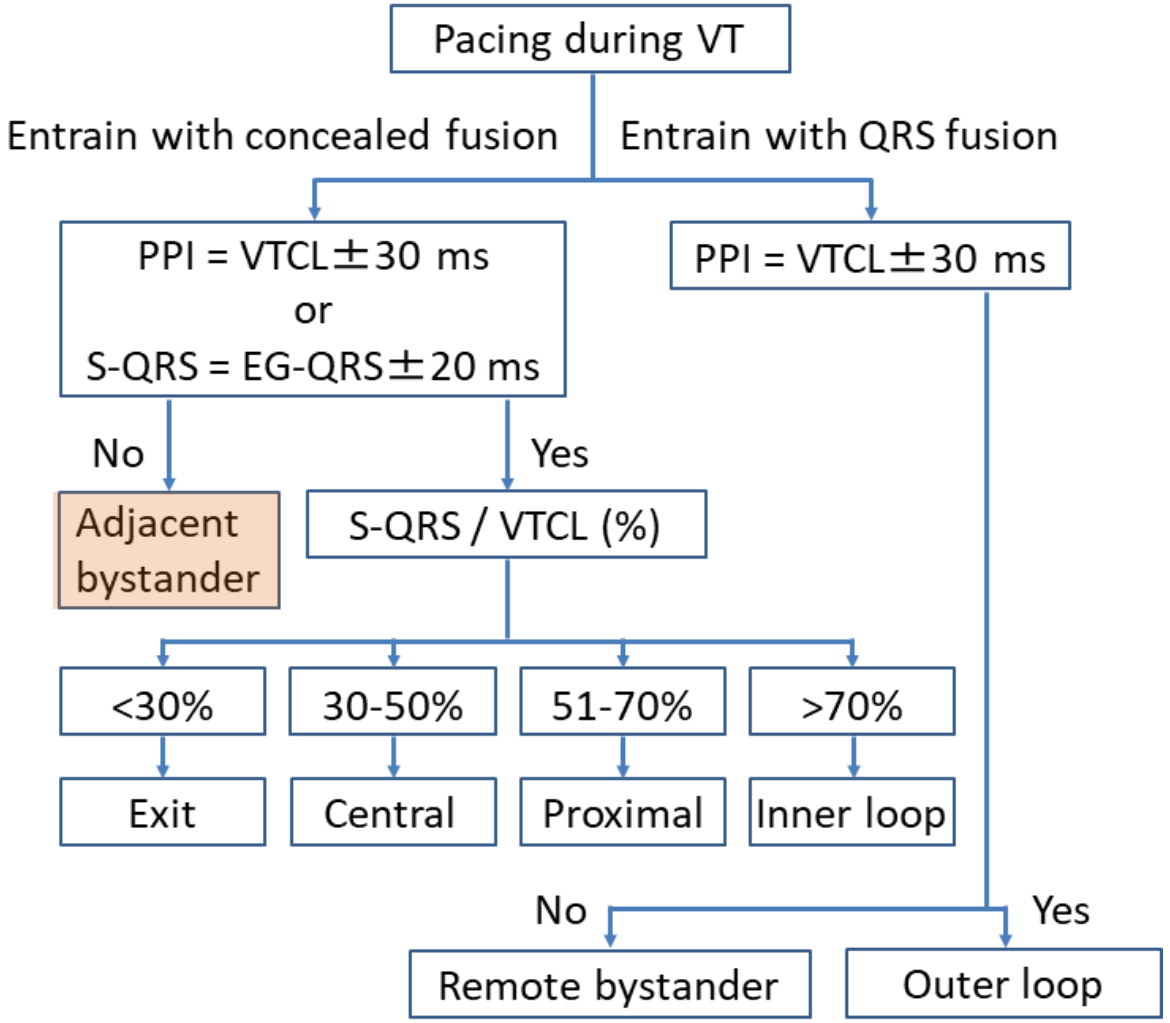
1. Remote bystander
2. Inner loop
3. Adjacent bystander
4. 上記いずれでもない
5. わかりません

Entrainment Pacing 2: Low output pacing



Identification of reentry circuit sites during catheter mapping and radiofrequency ablation of ventricular tachycardia late after myocardial infarction.





Stevenson WG, et al. Circulation 1993; 88: 1647-70.

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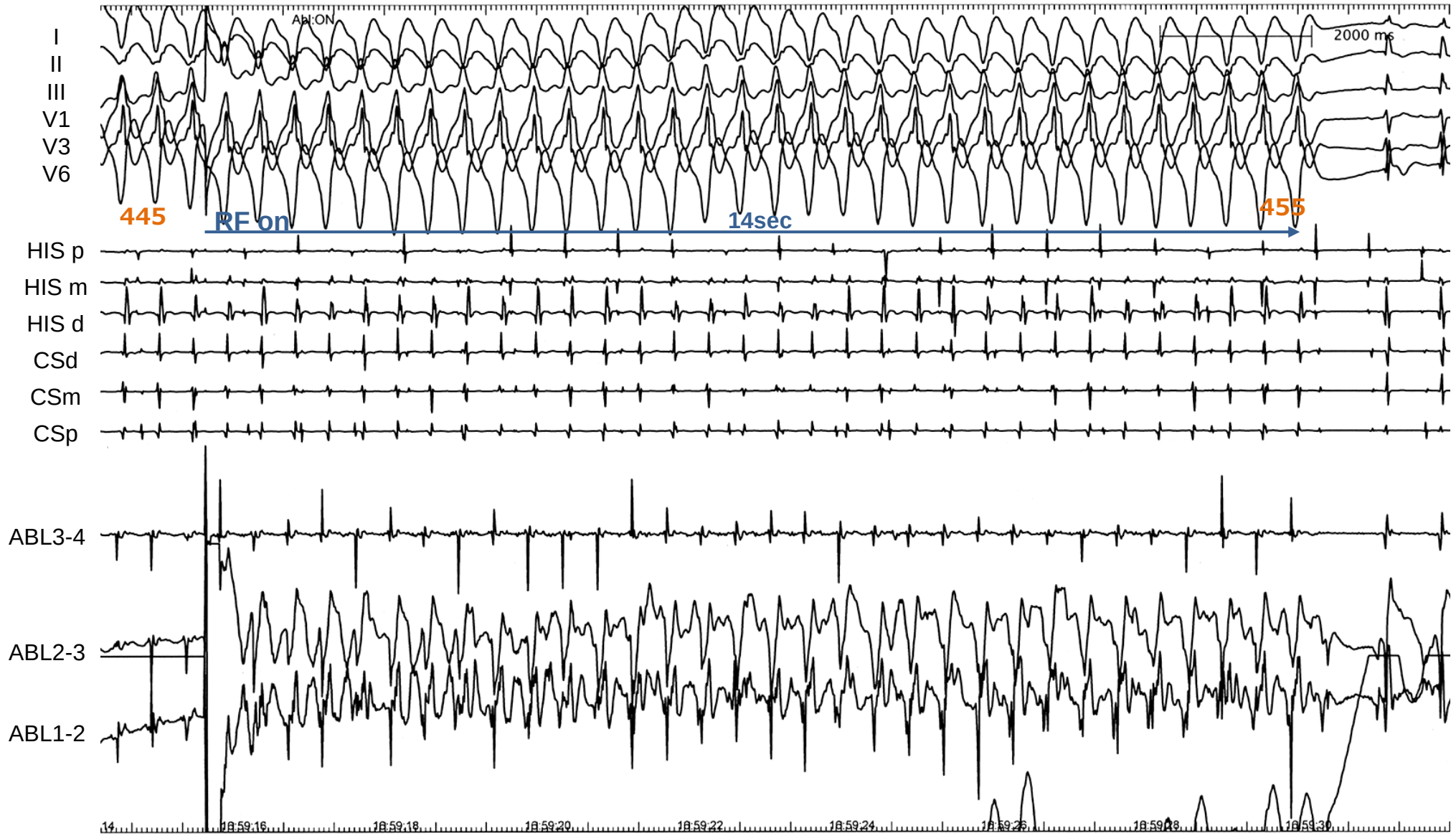
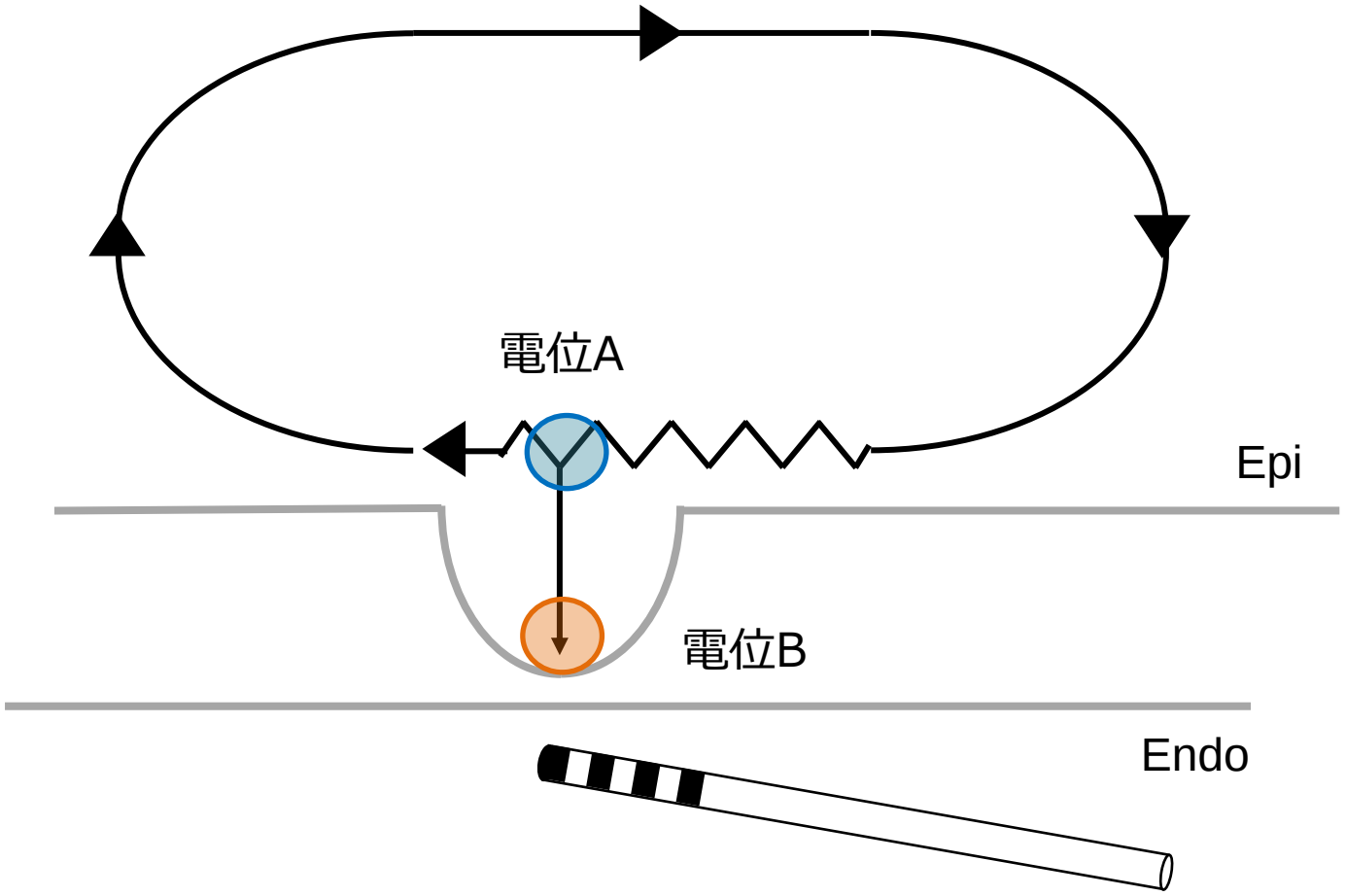
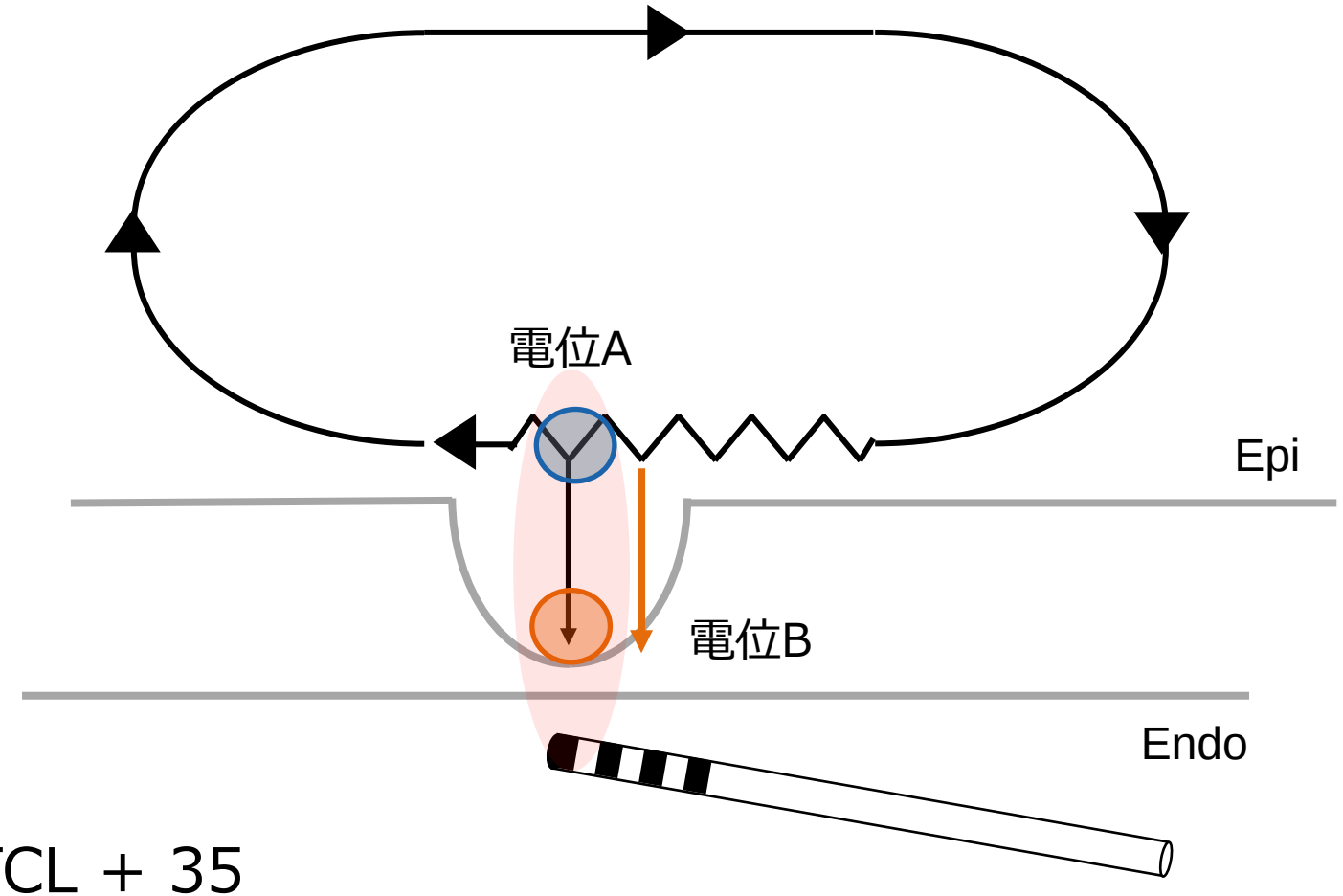
RF#1 VT Termination



VT Circuit

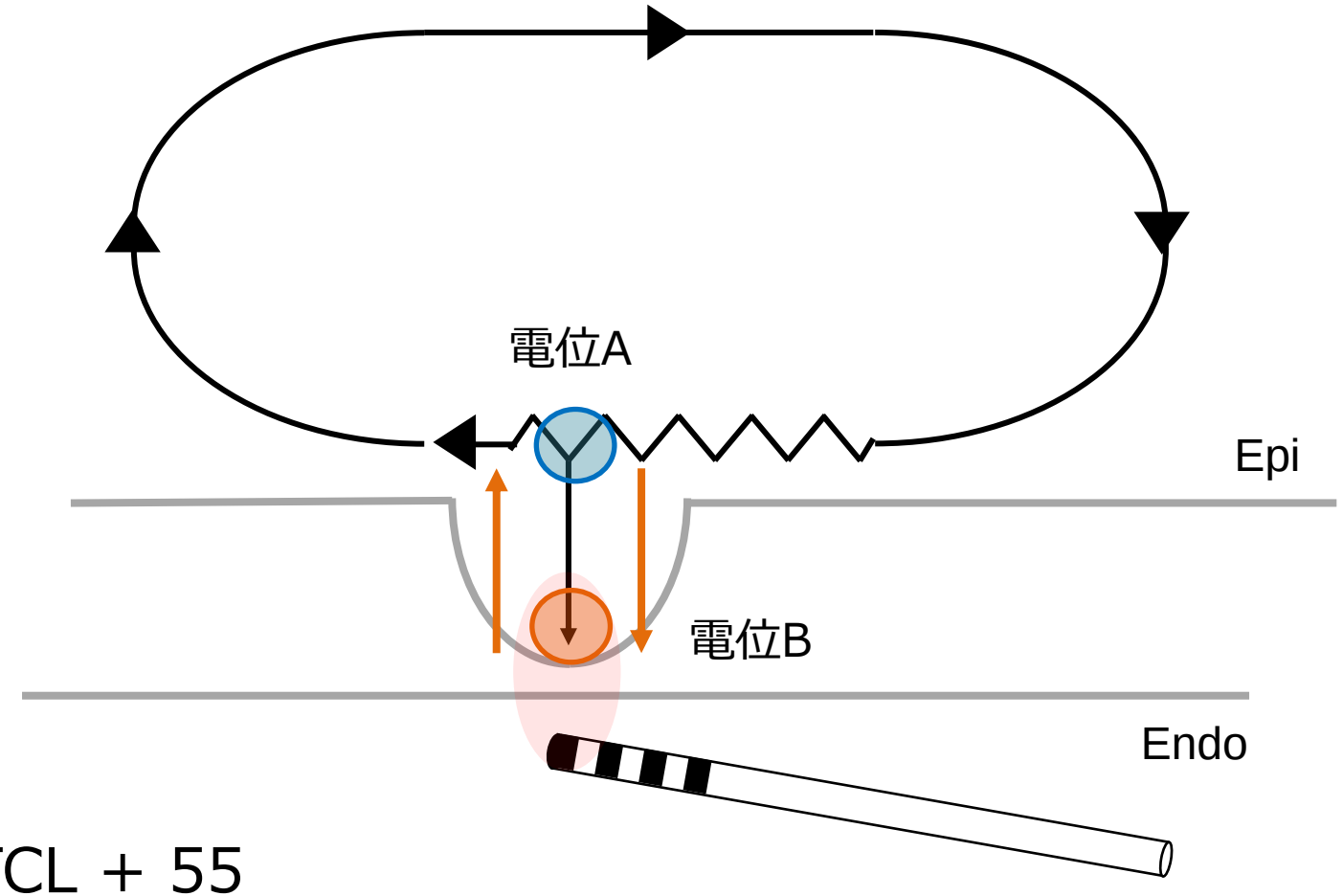


Entrainment Pacing 1: High Output Pacing



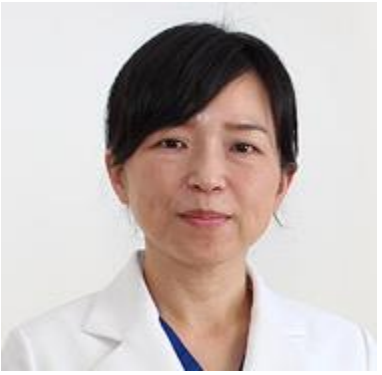
PPI = VTCL + 35

Entrainment Pacing 1: Low Output Pacing



PPI = VTCL + 55

Radiofrequency Catheter Ablation of Ventricular Tachycardia in Patients With Hypertrophic Cardiomyopathy and Apical Aneurysm



Miyako Igarashi, MD,[a] Akihiko Nogami, MD,[a] Kenji Kurosaki, MD,[b] Yuichi Hanaki, MD,[a] Yuki Komatsu, MD,[a] Seiji Fukamizu, MD,[c] Itsuro Morishima, MD,[d] Kazuaki Kaitani, MD,[e] Suguru Nishiuchi, MD,[e] Ahmed Karim Talib, MD,[a] Takeshi Machino, MD,[a] Kenji Kuroki, MD,[a] Hiro Yamasaki, MD,[a] Nobuyuki Murakoshi, MD,[a] Yukio Sekiguchi, MD,[a] Keisuke Kuga, MD,[a] Kazutaka Aonuma, MD[a]

ABSTRACT

OBJECTIVES This study evaluated the characteristics and results of radiofrequency catheter ablation (RFCA) of ventricular tachycardia (VT) in patients with hypertrophic cardiomyopathy (HCM) and left ventricular apical aneurysm (AA).

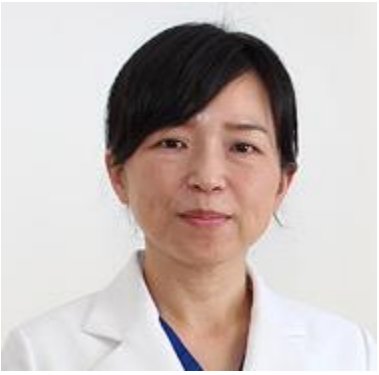
BACKGROUND Monomorphic VT in patients with HCM and left ventricular AA has been reported. However, outcome data of RFCA are insufficient.

METHODS Fifteen patients with HCM and AA who underwent RFCA for VT at 5 different institutions were included in this study. The data were evaluated retrospectively.

J Am Coll Cardiol EP 2018;4:339–50.

TABLE 3 Results of Electrophysiological Study and RFCA

Case	VT Induction		3D Mapping System	Carto Sound	Ablation Catheter	Endocardial Substrate Map		Estimated Exit Site of VT	Effective Ablation Site	Effectiveness of RFCA
	Clinical VT	Nonclinical VT				LVA at AA	LP in AA			
1	Nonsustained	0	Carto	–	Irrigated	+	–	Epi	Anterior wall of AA neck side	Noninducible
2	Nonsustained	0	Carto	–	Irrigated	+	+	Epi	Anterior wall of AA neck side	Noninducible
3	Sustained	0	-	–	8-mm Nonirrigated	+	+	Endo	Anterior wall of AA neck side	VT termination and noninducible
4	Sustained	1	Carto	–	4-mm Nonirrigated	+	+	Endo	Criss-cross linear ablation within AA	Only nonclinical VT was inducible
5	Sustained	1	Carto	–	4-mm Nonirrigated	+	+	Epi	Linear ablation within AA	Only nonclinical VT was inducible
6	Sustained	0	NavX	–	8-mm Nonirrigated	+	+	Epi	Anterior wall of AA neck side	VT termination and noninducible
7	Sustained	0	Carto	–	Irrigated	+	+	Epi	Anterior and anteroseptal scar border in AA	VT termination and noninducible
8	No	0	Carto	–	Irrigated	+	–	Endo	Anterior and anterolateral scar border in AA	Noninducible
9	Sustained	0	Carto	+	Irrigated	+	+	Endo	Anterior and antero-septal scar border in AA	VT termination and noninducible
10	Sustained	0	Carto	+	Irrigated	+	+	Endo	Anterior and anteroseptal scar border in AA	Noninducible
11	Sustained	6	Carto	+	Irrigated	–	+	Endo	Anterior wall of AA neck side	VT termination and noninducible
12	Sustained	4	Carto	+	Irrigated	+	+	Endo/Epi	Anterior scar border in AA	Noninducible
13	Nonsustained	0	Carto	+	Irrigated	+	+	Endo	Anterior and anterolateral scar border in AA	Noninducible
14	Sustained	0	Carto	–	Irrigated	–	–	Epi	Epicardial site of AA neck	VT termination and noninducible
15	Sustained	1	Carto	+	Irrigated	–	+	Epi	Anterior wall of AA neck side	Noninducible



Epi Exit, 8/15

Endo ablation, 7/8

Igarashi M, Nogami A, /, Morishima I, et al. J Am Coll Cardiol EP 2018;4:339–50.

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Case 3

この頻拍の回路は？

心尖部心室瘤を伴う肥大型心筋症を背景とした左室心尖部心外膜側にExitと主たる回路を有するリエントリー性心室頻拍

意図的にHigh outputでentrainment pacingすることで、Far field potentialの評価ができる場合がある.

心内膜側からのみの通電でカテーテルアブレーションに成功.

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Case 4

Para-Hisian Pacingの示すPathways

55M, SVT

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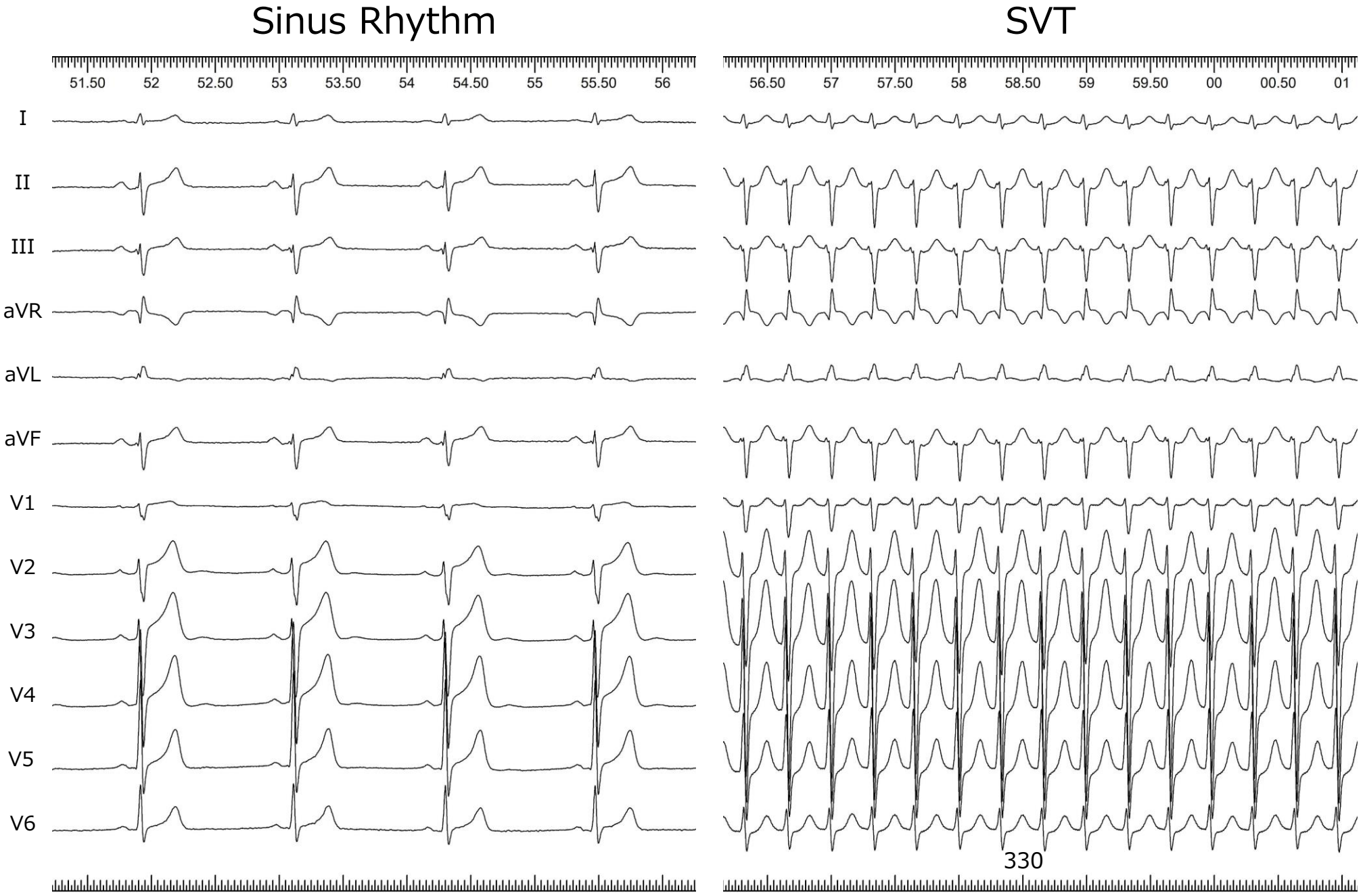
Case 4

55M

SVT



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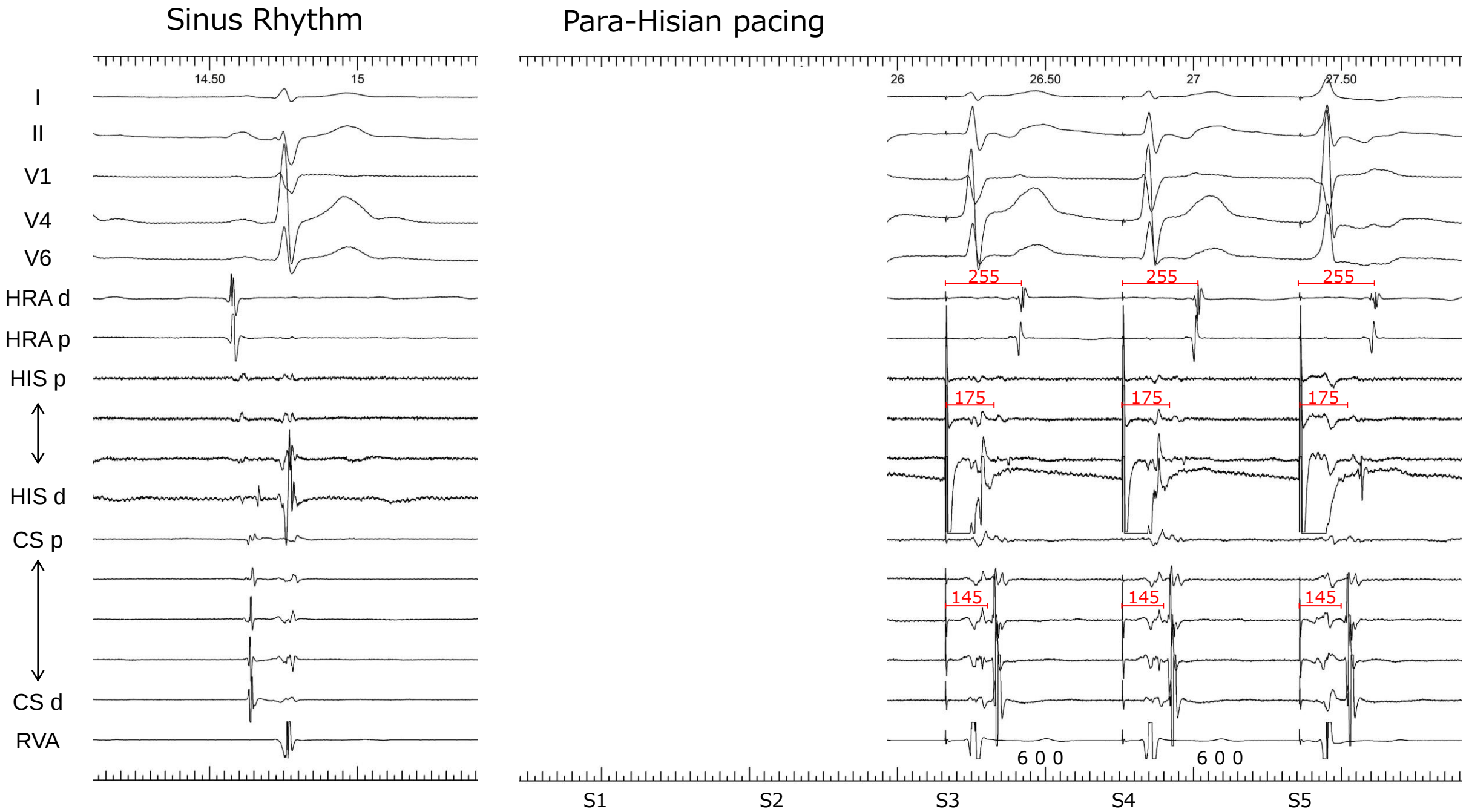

Q4 -1　室房伝導経路として最も可能性が高いものは？

1. AV nodal, Slow pathway
2. AV nodal, Fast pathway
3. Extra nodal
4. Extra nodal + AV nodal
5. AV nodal, Dual pathway
6. わかりません

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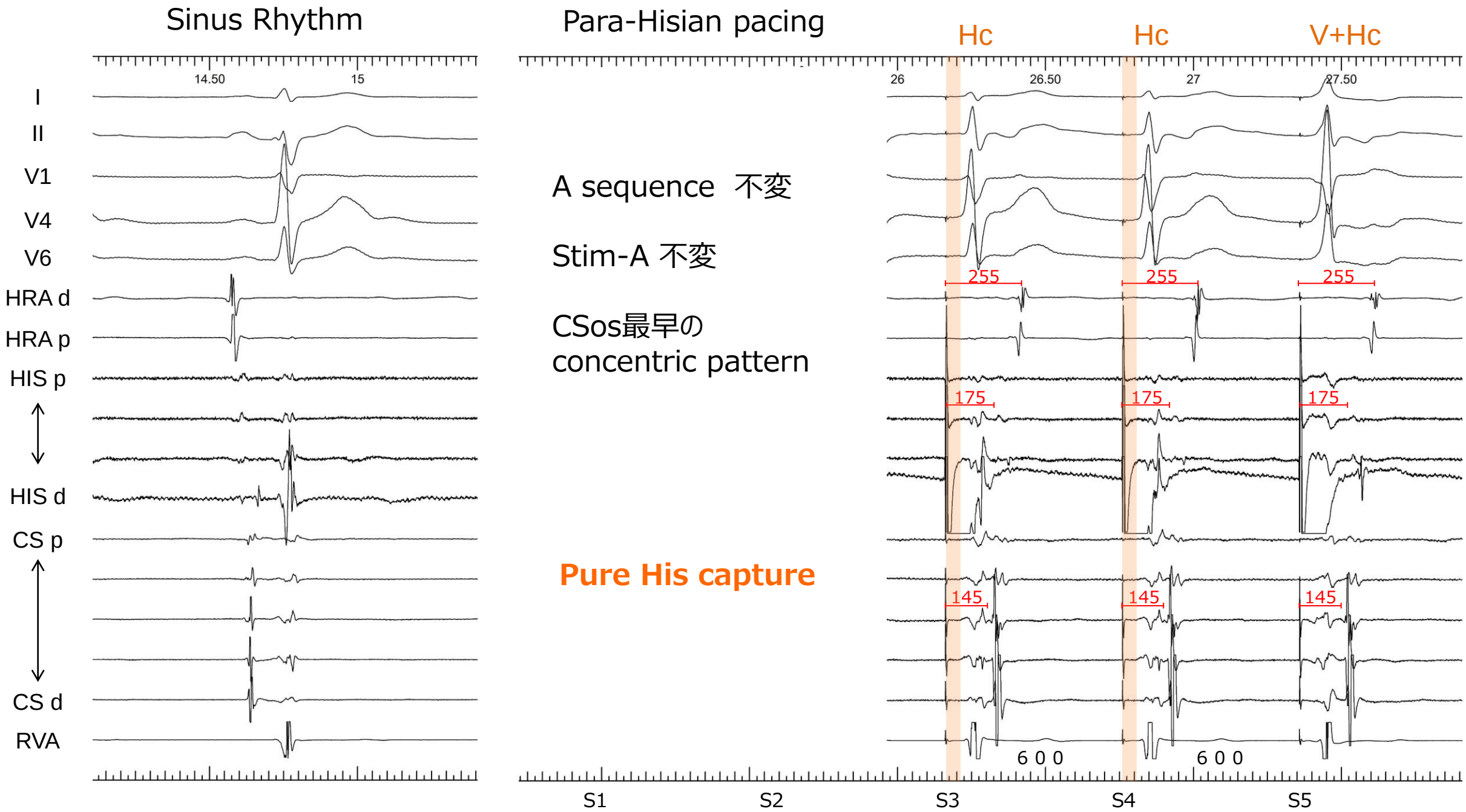
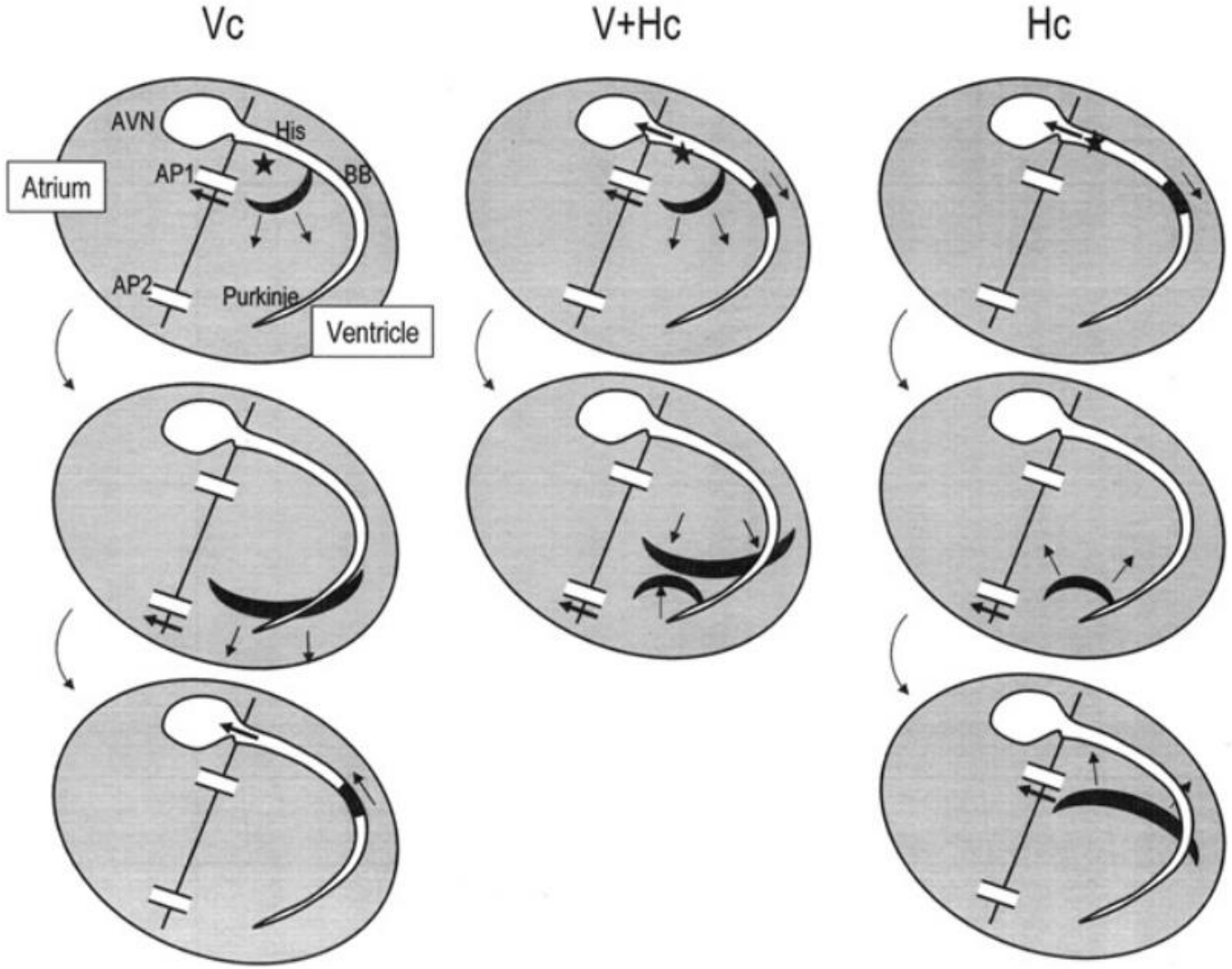


A4 - 1　室房伝導経路として最も可能性が高いものは？

1. AV nodal, Slow pathway
2. AV nodal, Fast pathway
3. Extra nodal
4. Extra nodal + AV nodal
5. AV nodal, Dual pathway
6. わかりません

Clinical implications of “pure” Hisian pacing in addition to para-Hisian pacing for the diagnosis of SVT



AP1, AP2, AVNのモデル

Pure Hsian pacingでは中隔心筋の興奮が遅れる.
副伝導路の鑑別に有用な場合がある.

Takatsuki S, et al. Heart Rhythm 2006;3:1412–1418

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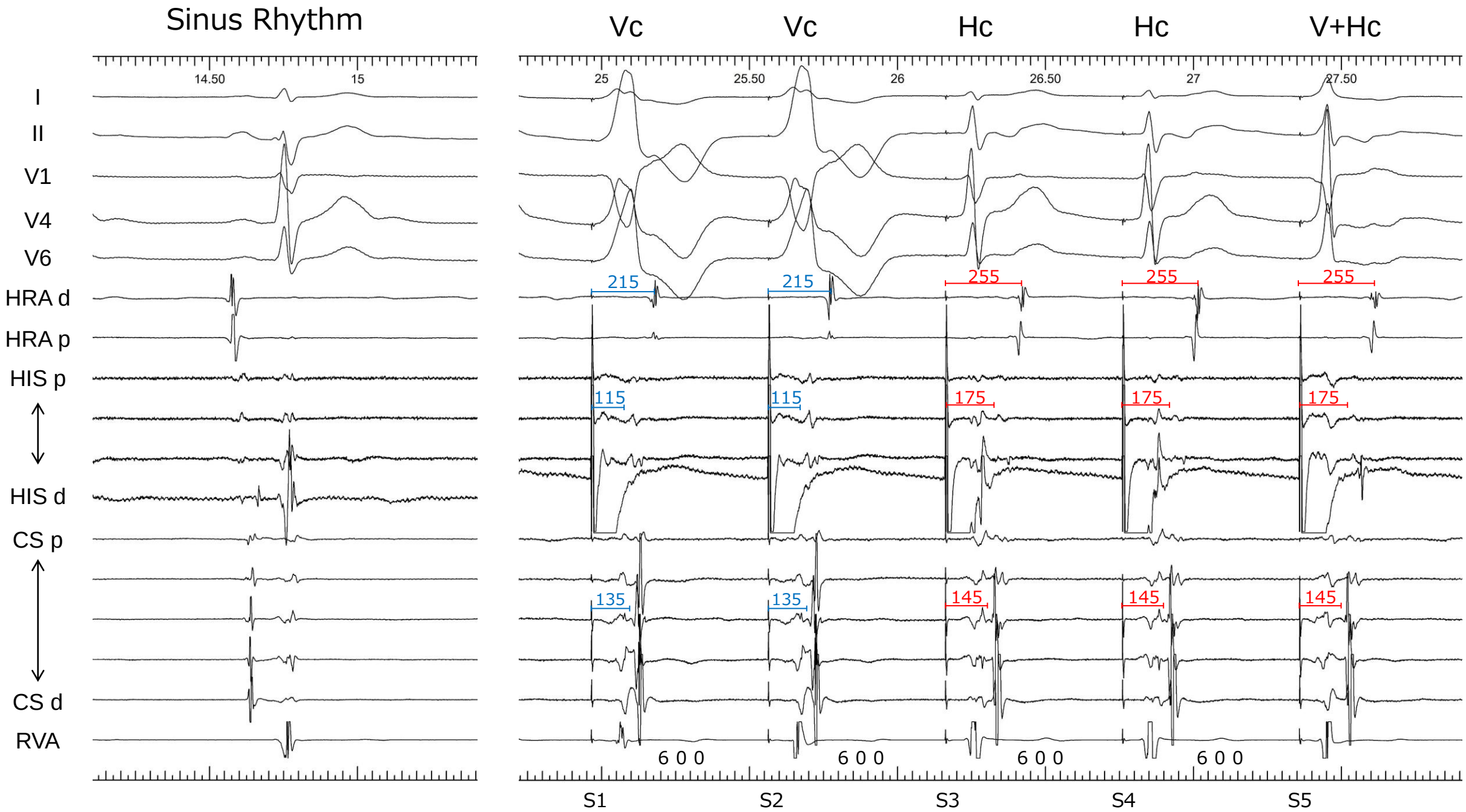

Q4 - 2　室房伝導経路として最も可能性が高いものは？

1. AV nodal, Slow pathway
2. AV nodal, Fast pathway
3. Extra nodal
4. Extra nodal + AV nodal
5. AV nodal, Dual pathway
6. わかりません

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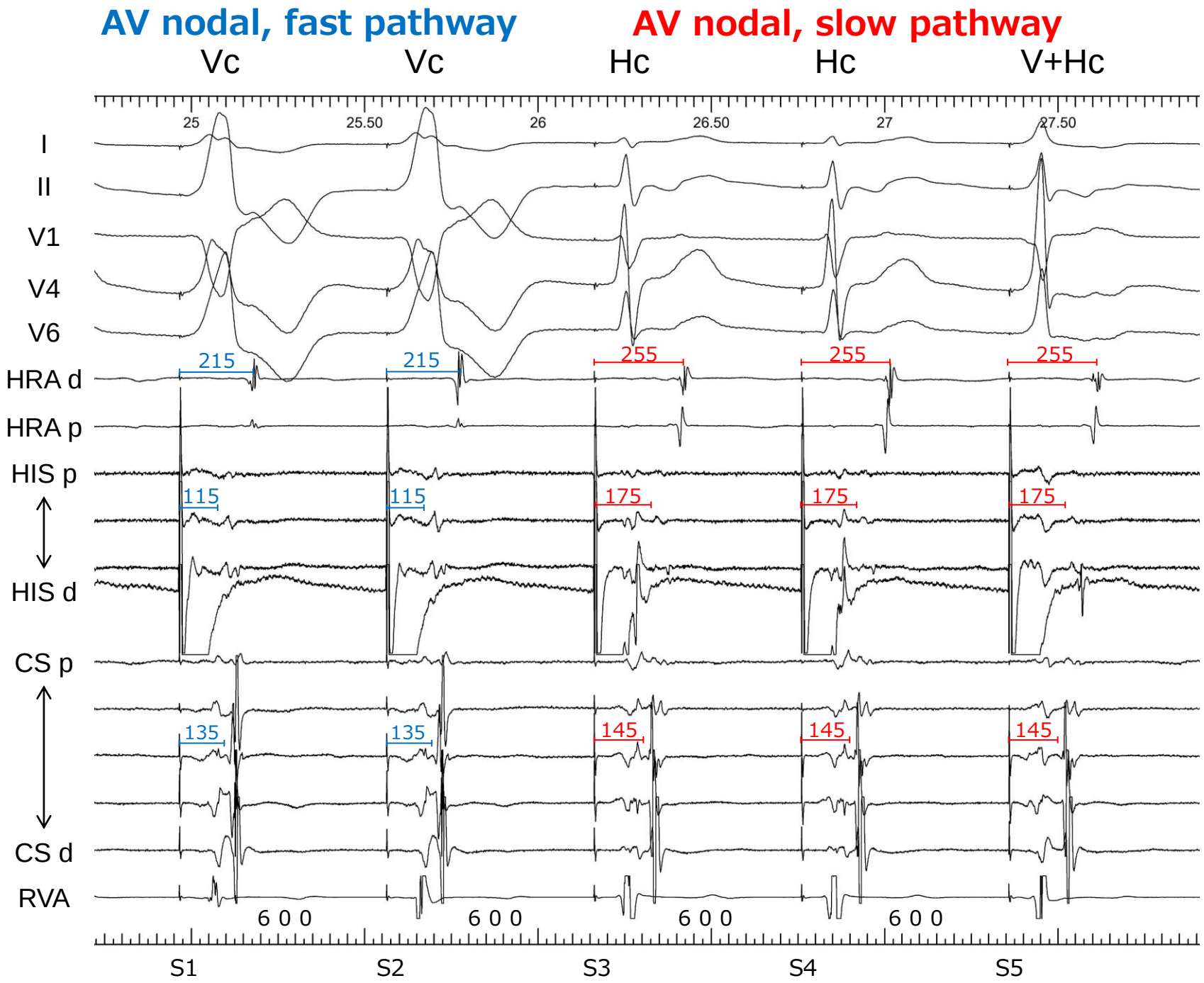
A4 - 2

1. AV nodal, Slow pathway
2. AV nodal, Fast pathway
3. Extra nodal
4. Extra nodal + AV nodal
5. AV nodal, Dual pathway
6. わかりません



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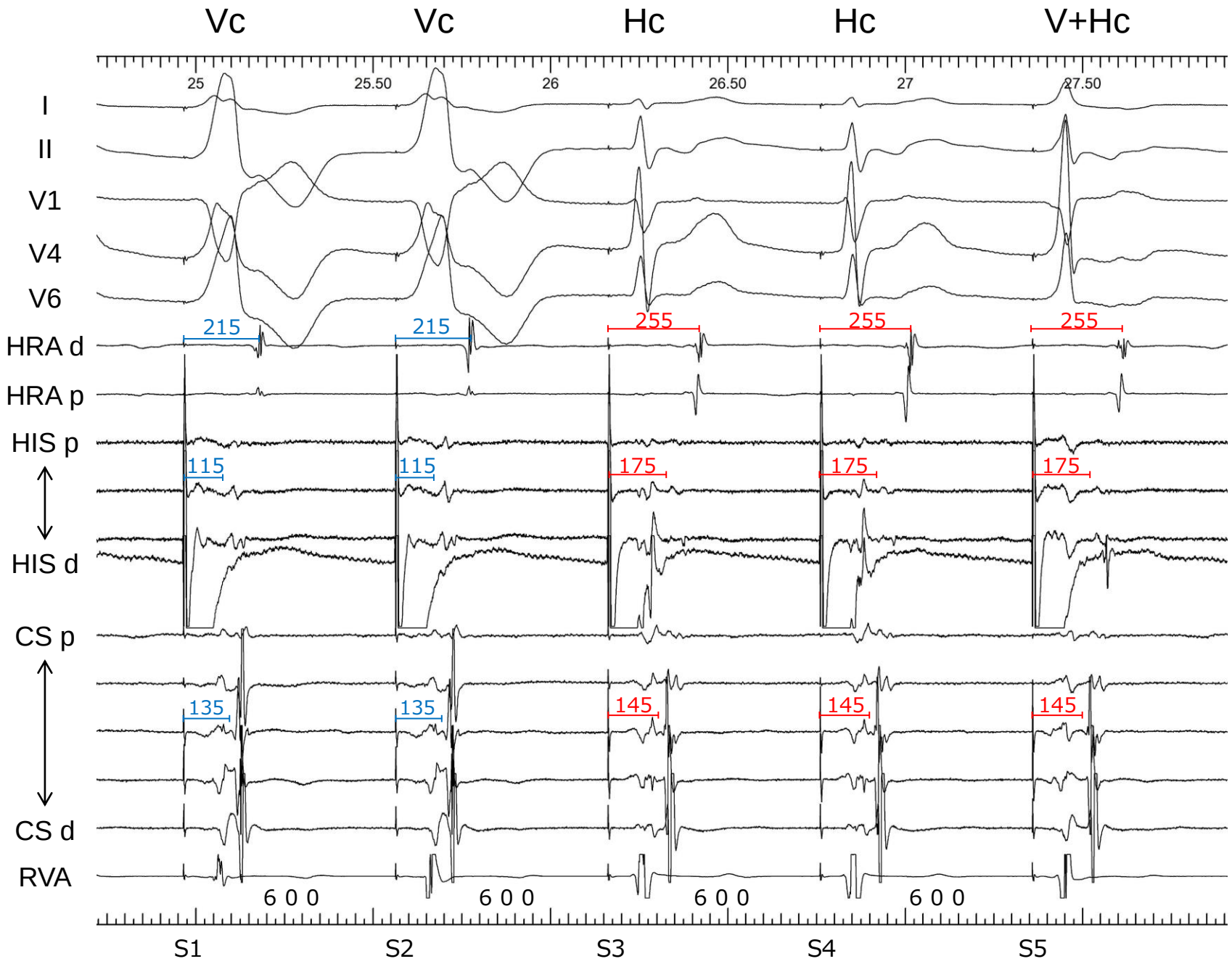
4- Suppl. Q

S3でVA伝導が変わる機序は？



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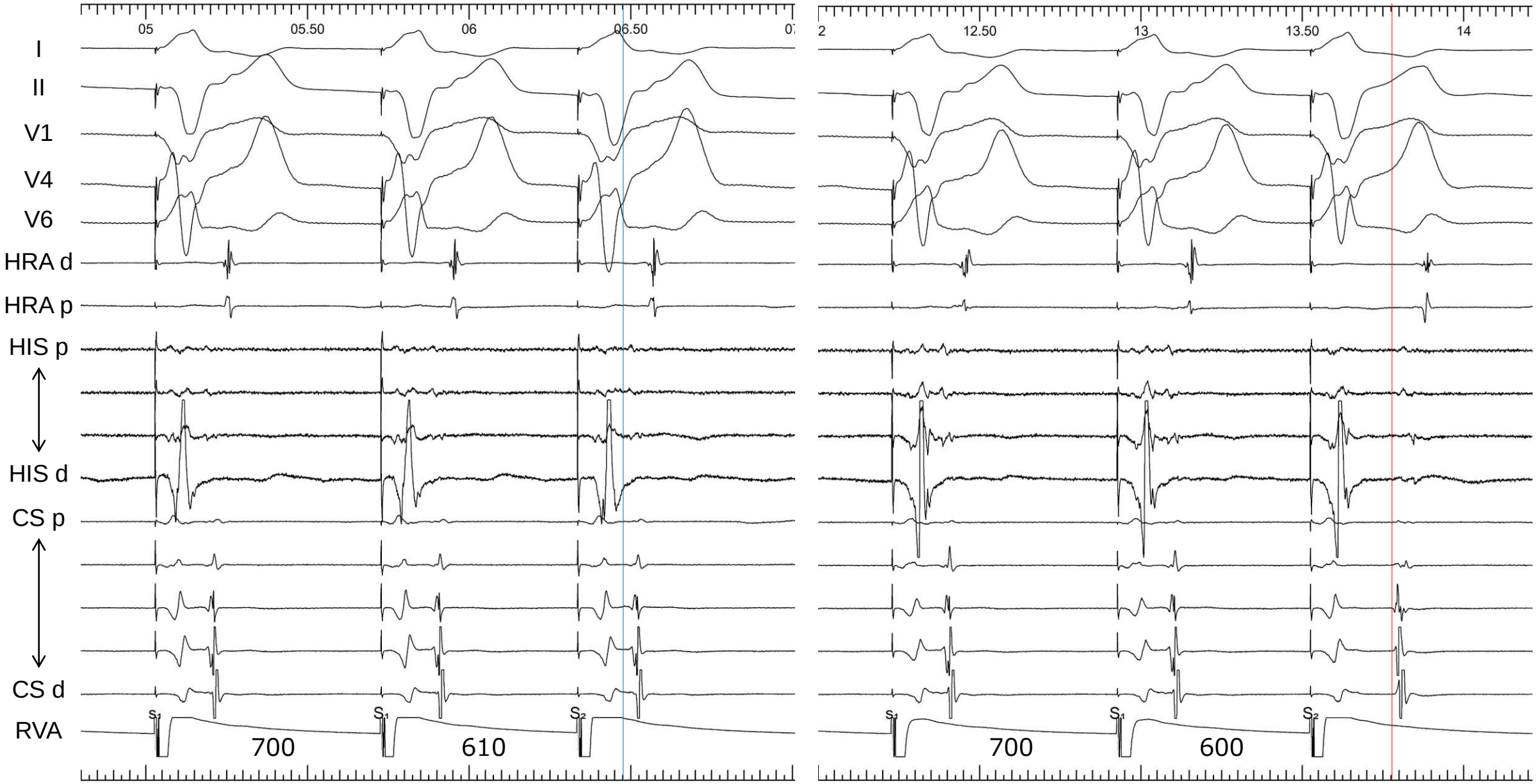
Retrograde fast pathway ERP



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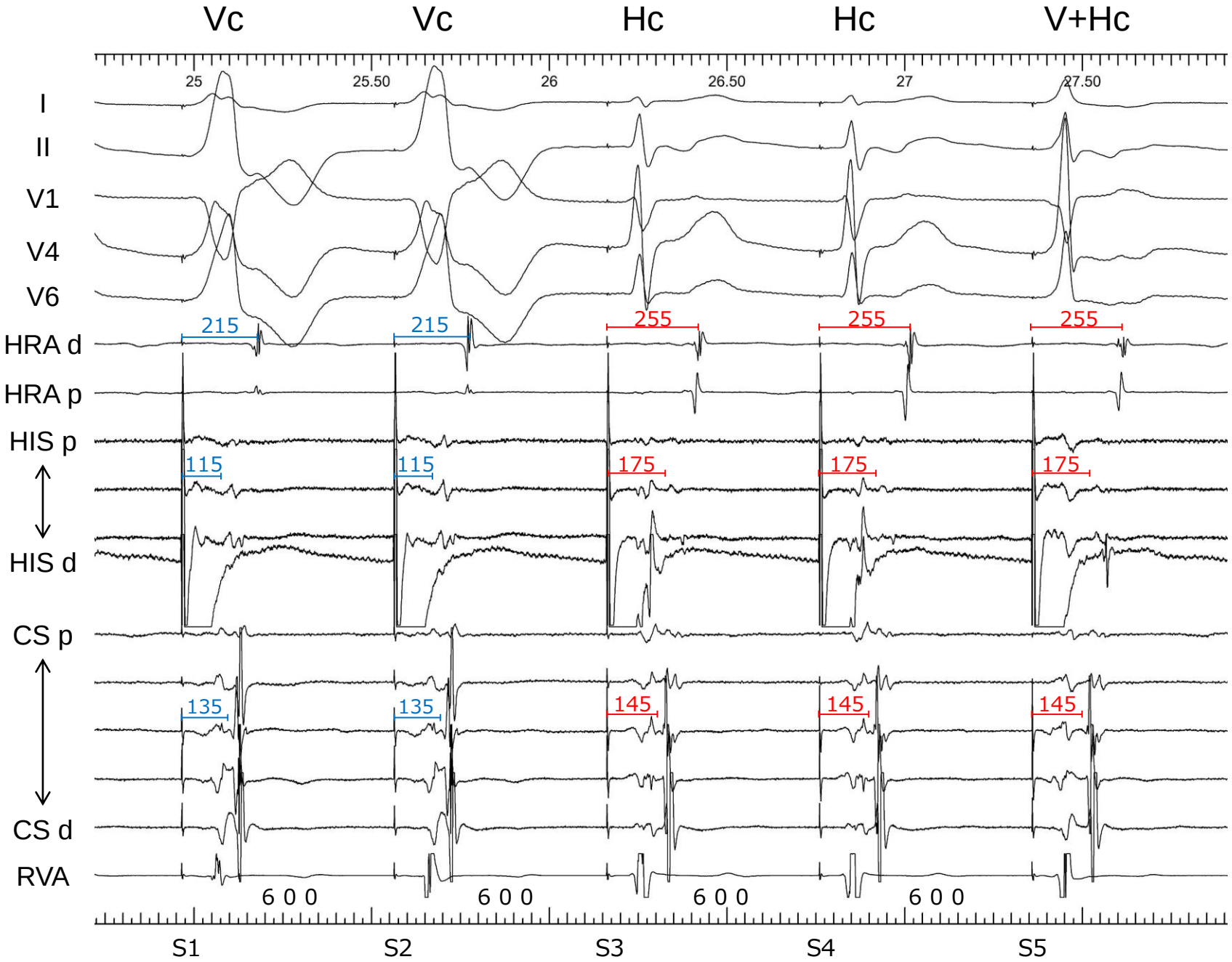
4- Suppl. A

S3でVA伝導が変わる機序は？

S1S2 = S2S3

H1H2 > H2H3

H2H3 < Retrograde fast pathway ERP



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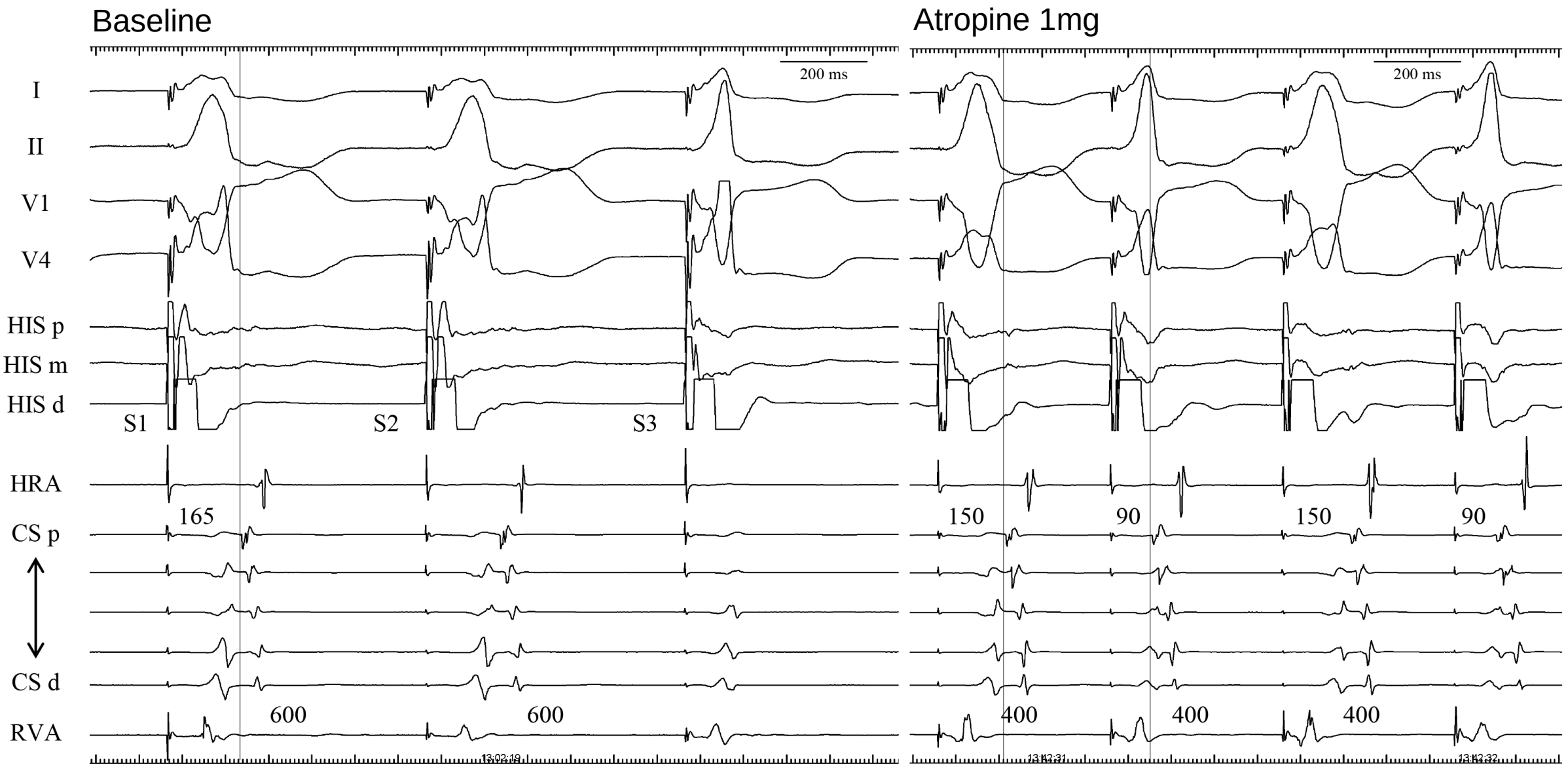
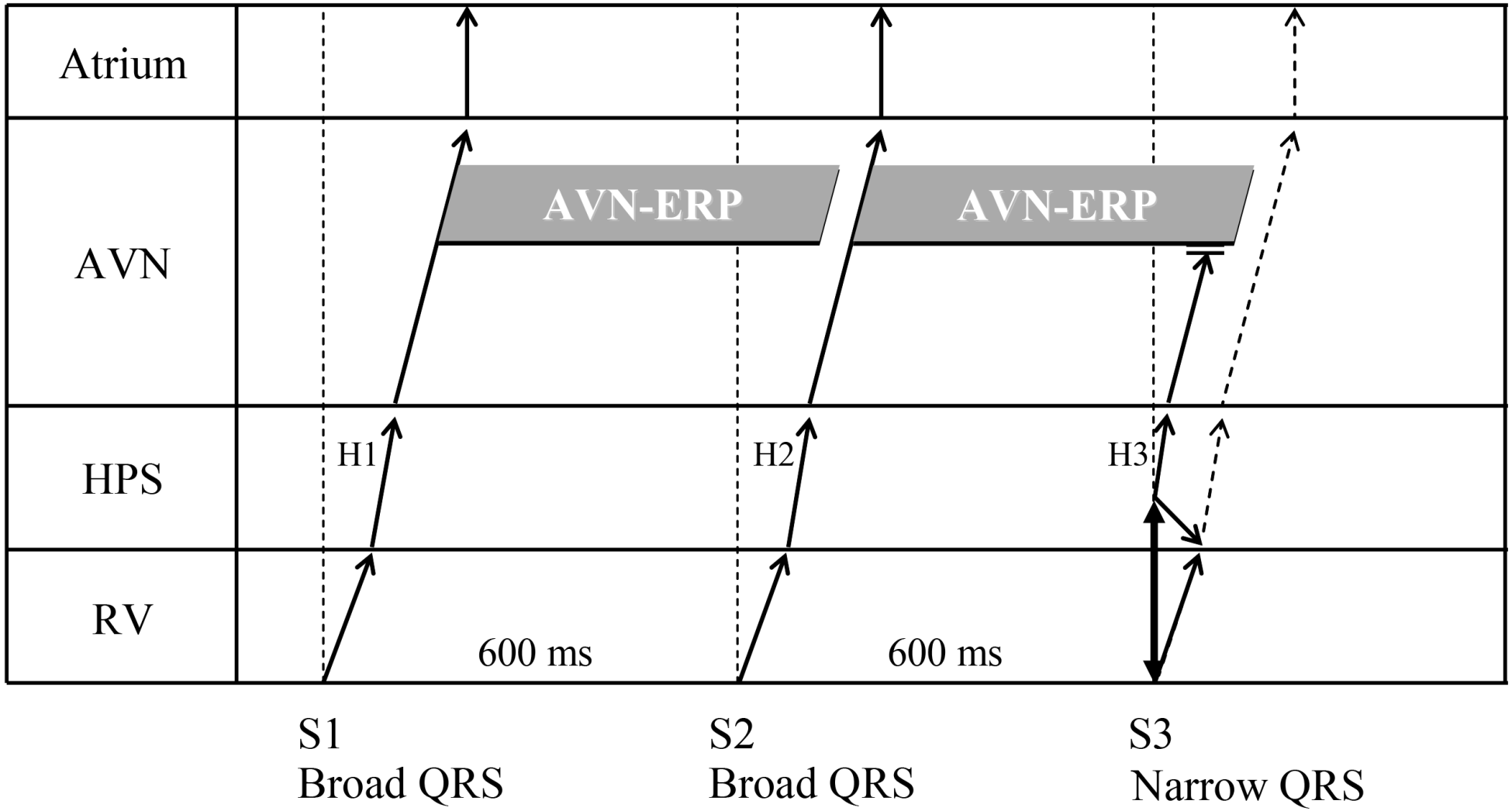
Broad → Narrow-paced QRS, VA block



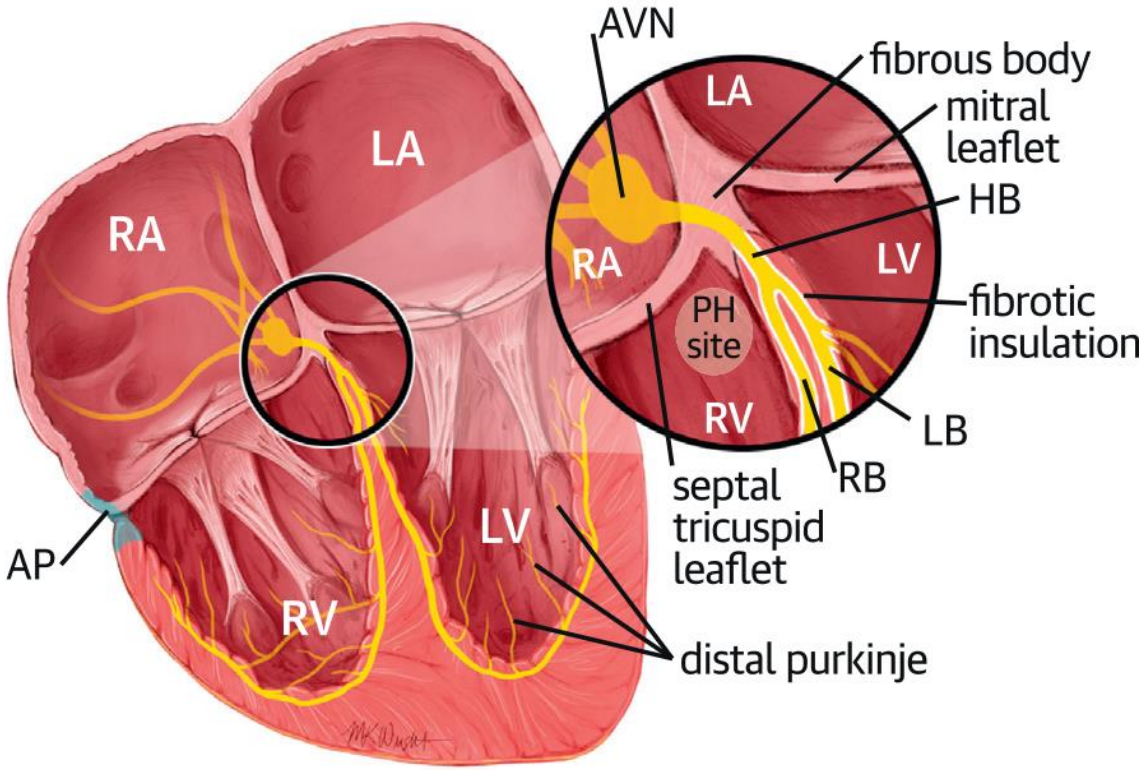
Morishima I, Suzuki F, Kanzaki Y, Heart rhythm 2019;16:1127-1128

H1-H2 > AVN-ERP > H2-H3



Morishima I, Suzuki F, Kanzaki Y, Heart rhythm 2019;16:1127-1128

Para-Hisian Pacing



Pacing outputを最大値から開始 (H+Vc)
Narrow QRS, Short SH

↓ Outputを下げる

Loss of direct His-RB capture (Vc)
Broad QRS, Long SH

- A sequence 不変
  - SA延長, VA延長 HA不変 → AVN
  - SA不変, VA不変 HA短縮 → AP
- A sequenceが変化 → AVN & AP

Ali H, et al. J Am Coll Cardiol EP 2019;5:1233–52

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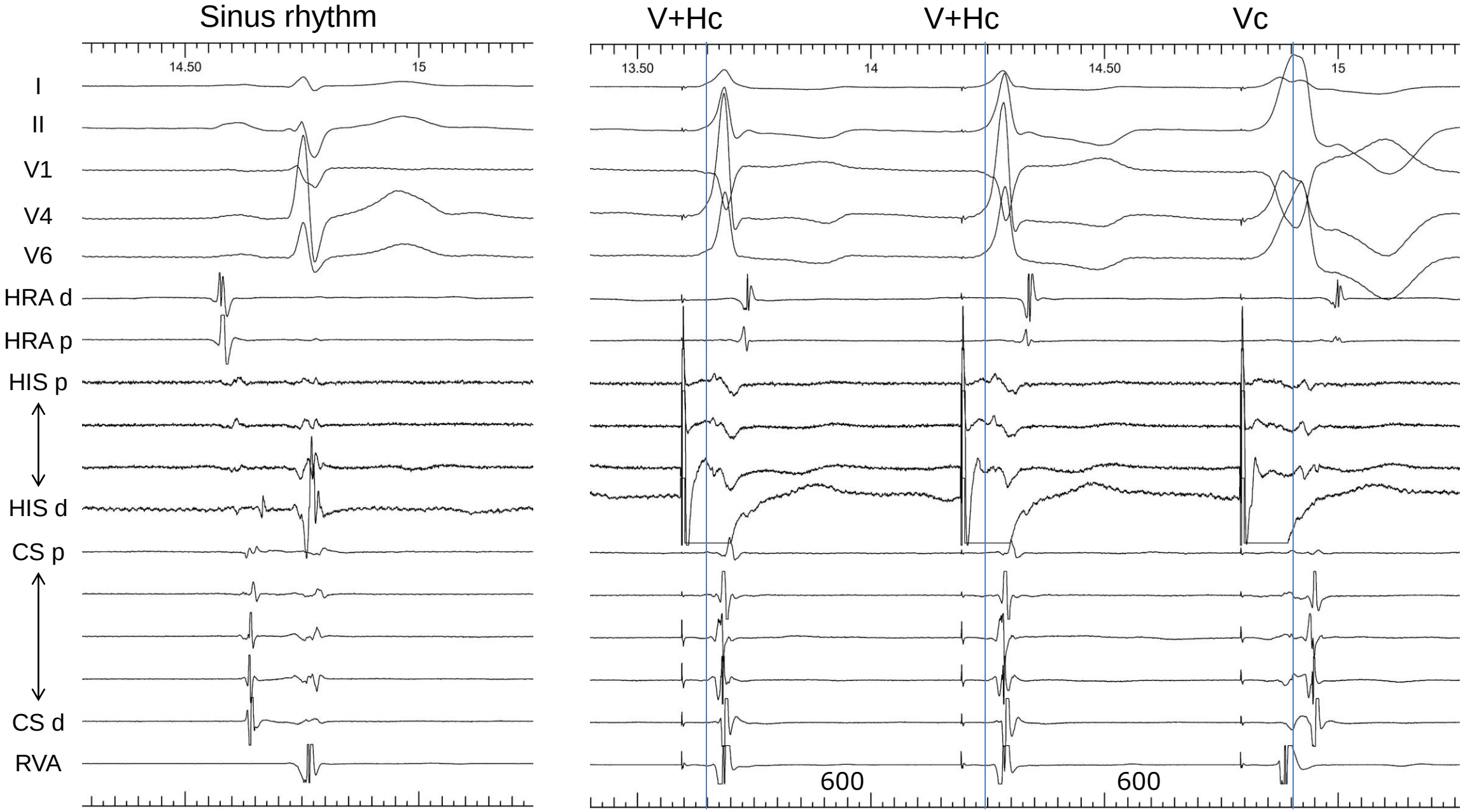
このケースでもNarrowからBroadでは、A sequenceは変わっていないことが分かります。



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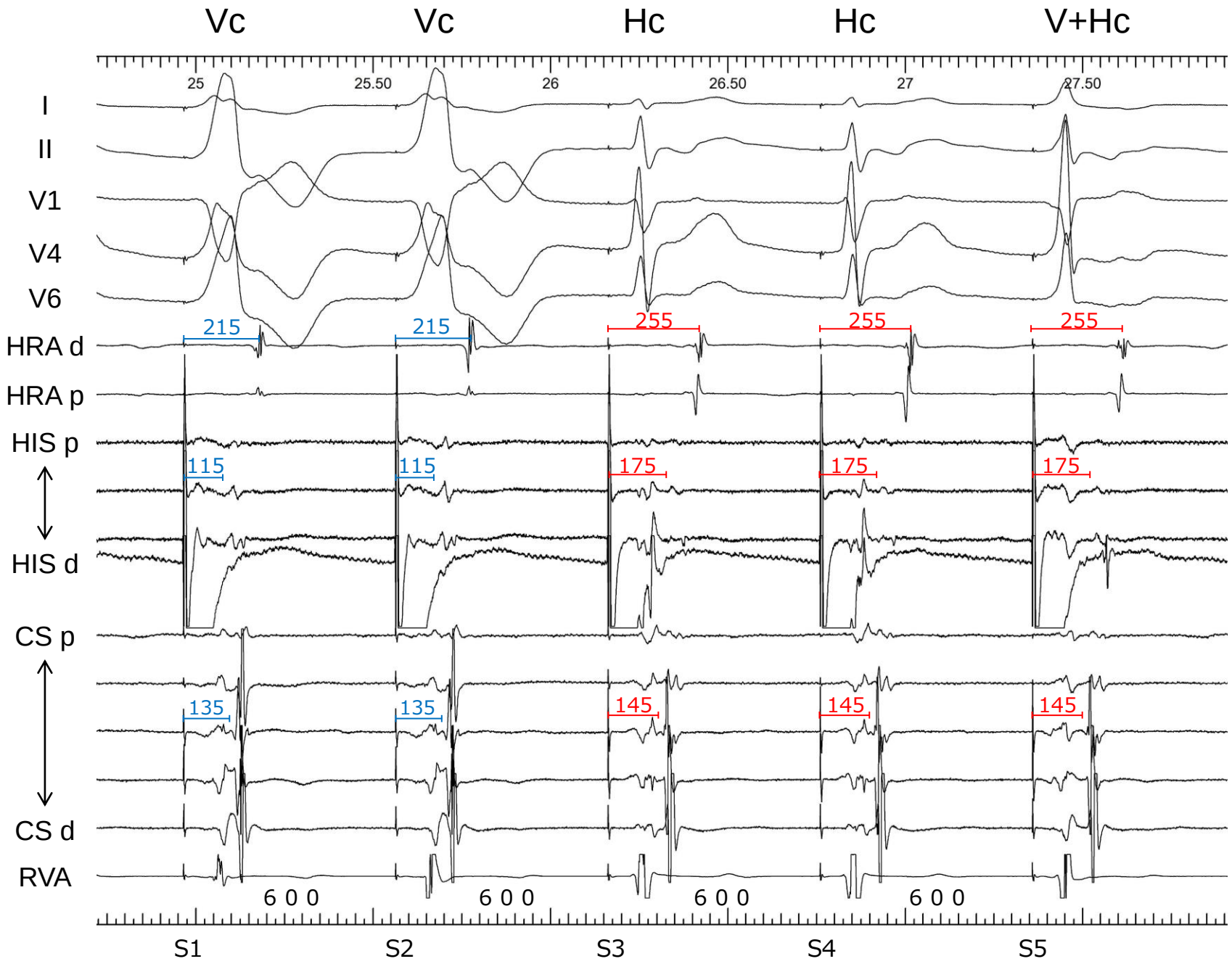
Q4 - 3

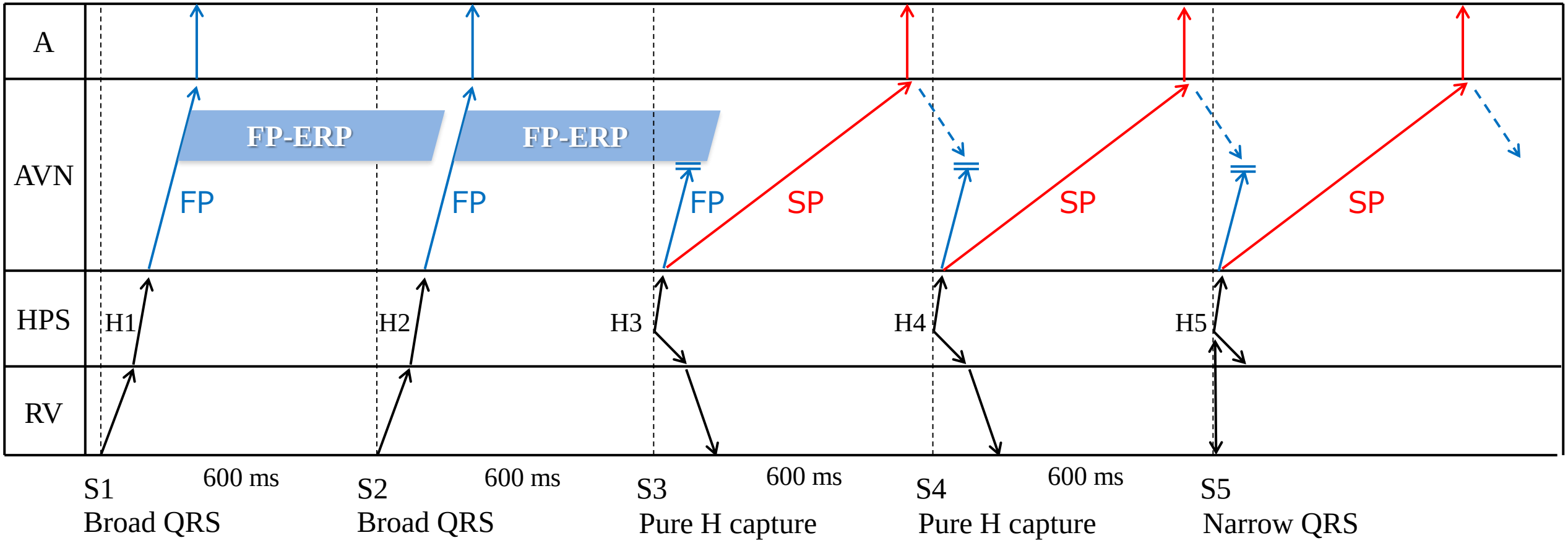
この心電図が示すPathwayは？

1. Retrograde AV nodal dual pathway
2. Retrograde AV nodal dual pathway + Antegrade fast pathway
3. Retrograde AV nodal dual pathway + Antegrade slow pathway
4. Retrograde AV nodal dual pathway + Antegrade accessory pathway
5. わかりません

A4, A5がA1、A２と同じにならない理由は？



Concealed anterograde invasion of the fast pathway



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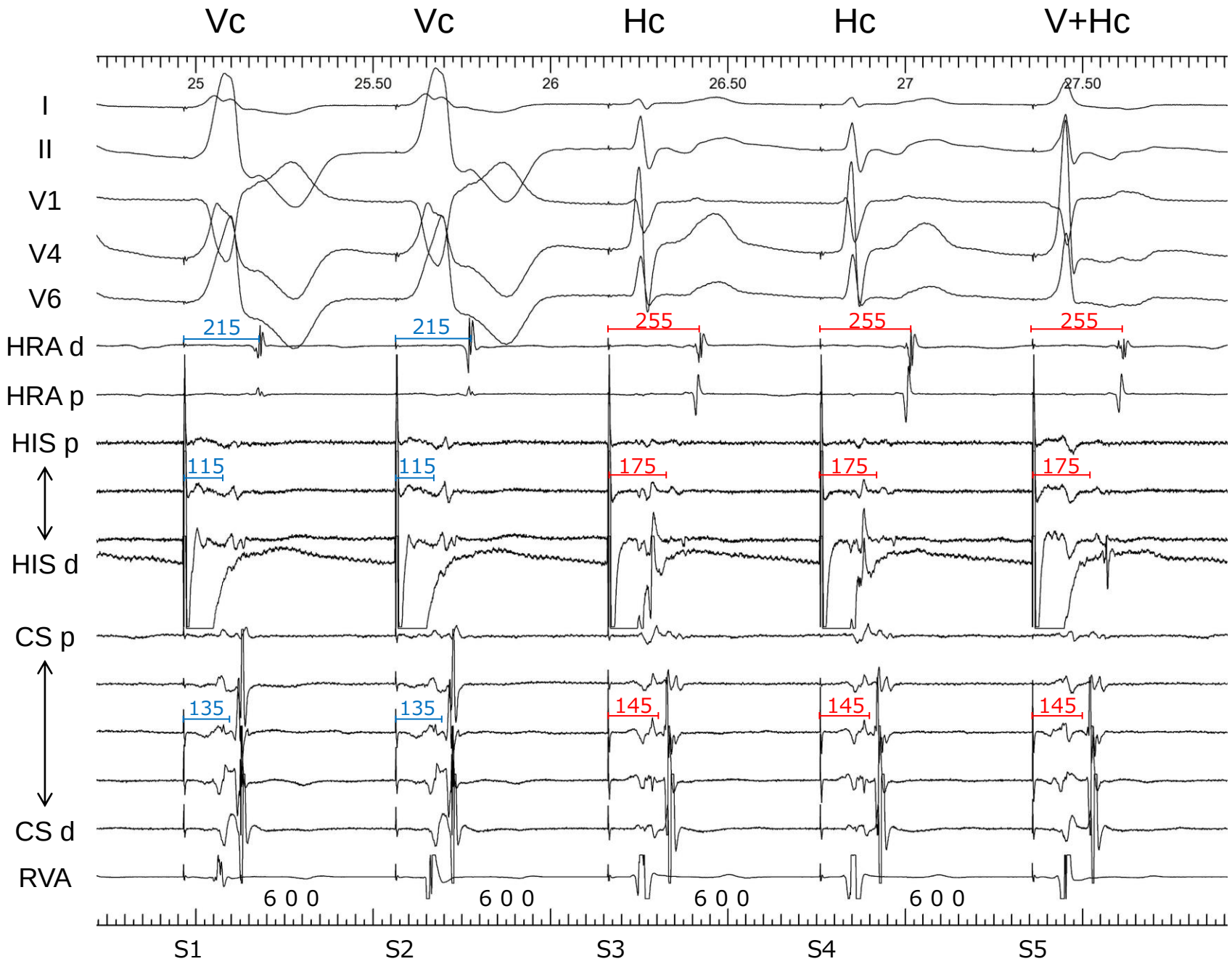
A4 - 3

この心電図が示すPathwayは？

1. Retrograde AV nodal dual pathway
2. Retrograde AV nodal dual pathway + Antegrade fast pathway
3. Retrograde AV nodal dual pathway + Antegrade slow pathway
4. Retrograde AV nodal dual pathway + Antegrade accessory pathway
5. わかりません



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Case 4

Para-Hisian Pacingの示すPathways

Retrograde AV nodal dual pathway + Antegrade fast pathway

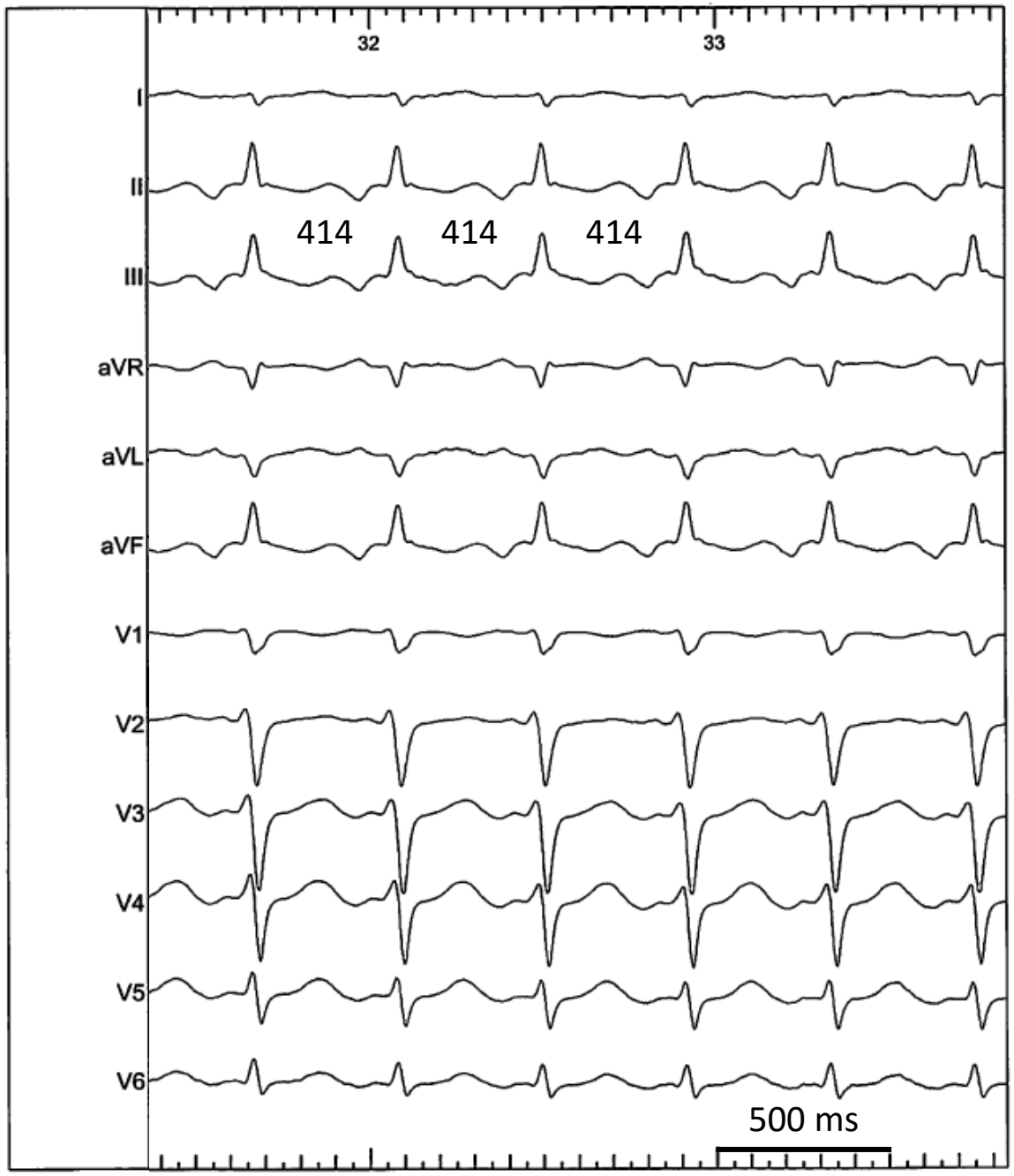
- ✓ Pure Hisian capture (Hc) を認識する.
- ✓ Broad QRS (Vc) から　Narrow QRS (H+Vc, Hc) ではHH時間が短縮する.

Case 5

この頻拍の診断は？

38M with long R-P’ tachycardia

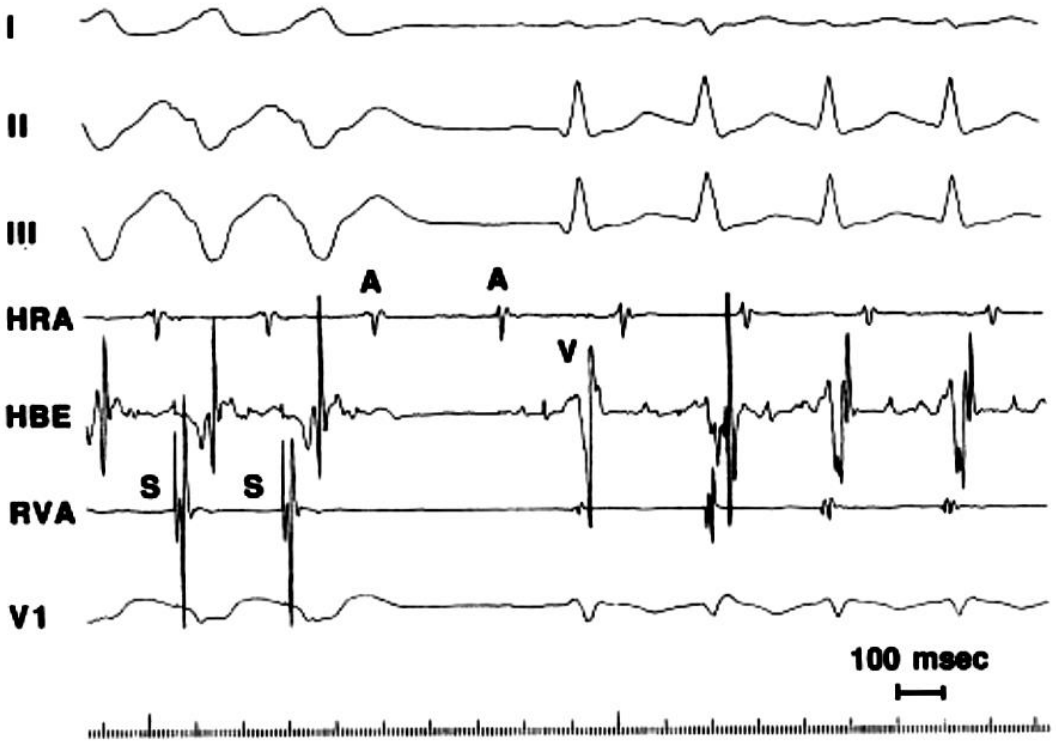
long R-P’ 頻拍



鑑別疾患

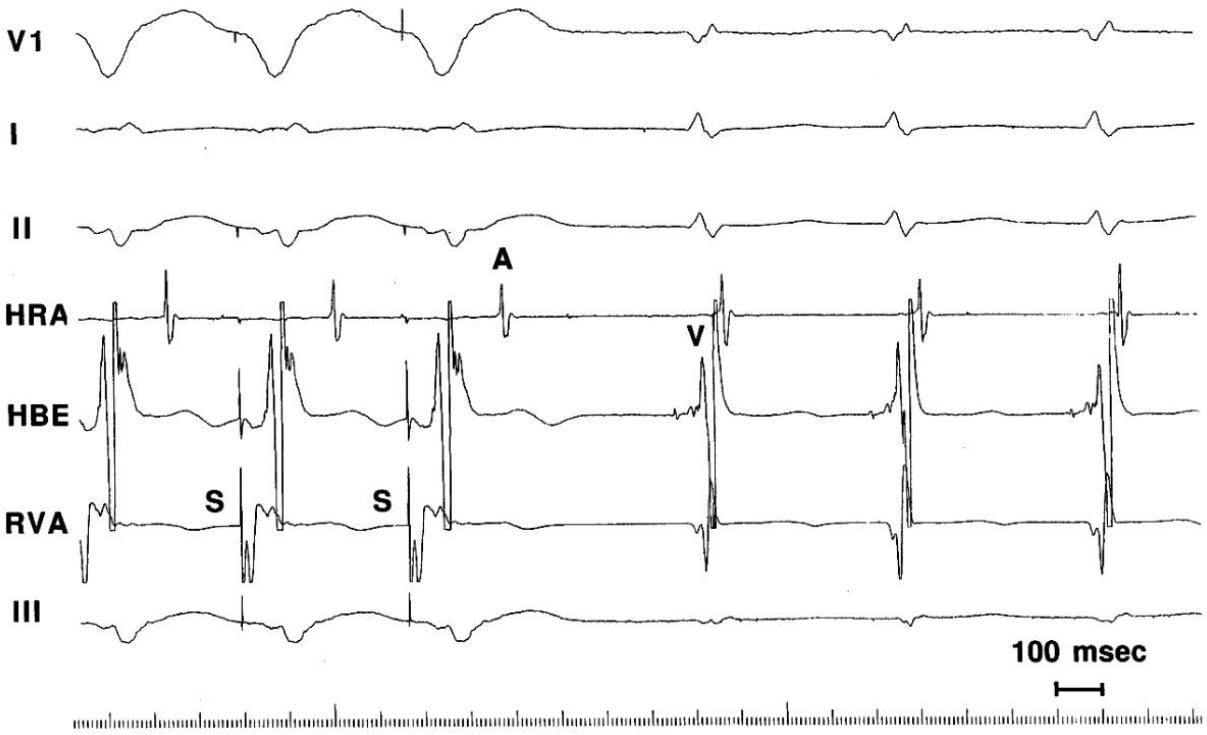
- AT
- AVNRT
- ORT (slow Kent)
- NV/NF ORT

V-A-A-(H)V Response



AT

V-A-(H)V Response

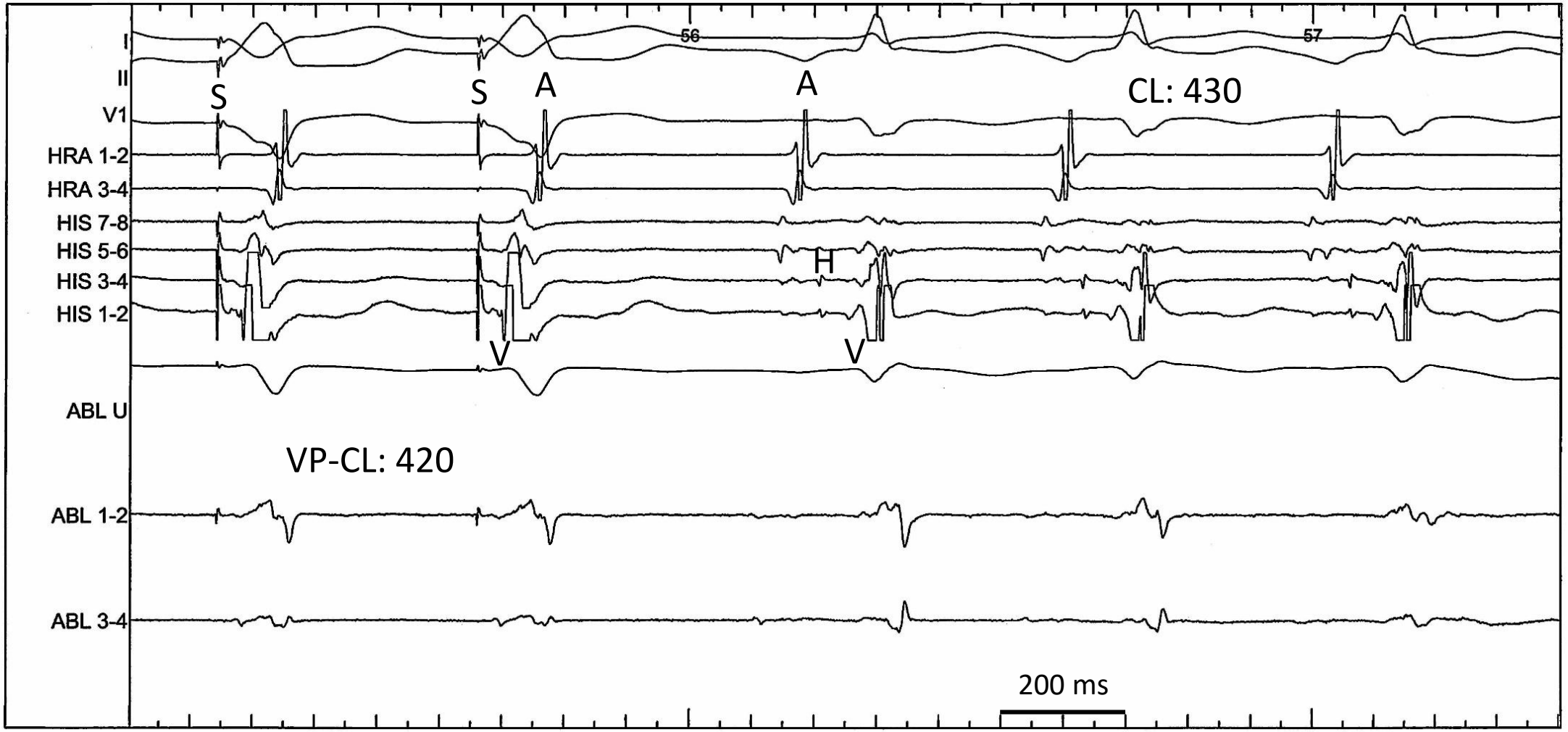


AVRT/AVNRT

Knight BP, Zivin A, Souza J, Flemming M, Pelosi F, Goyal R, Man KC, Strickberger SA, Morady F: A technique for the rapid diagnosis of atrial tachycardia in the electrophysiology laboratory. J Am Coll Cardiol 1999;33:775-781.

Entrainment from RV Septum during Long R-P’ Tachycardia

V-A-A-V Response



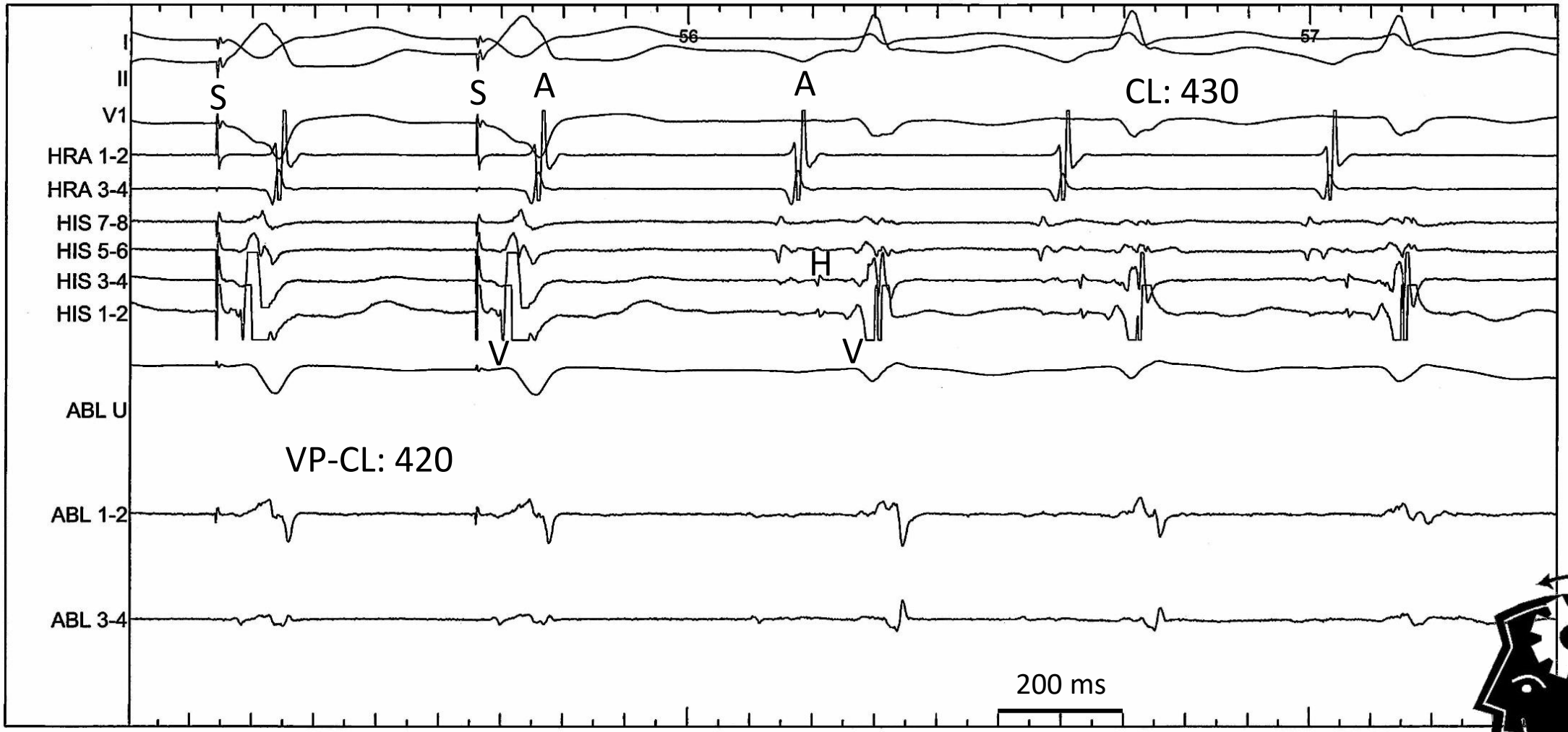
まず, 頻拍中にRVからエントレインしました。

Q5-1: このlong R-P’頻拍の機序は?

1. Atrial tachycardia
2. AVNRT
3. AVRT (ORT)
4. わかりません

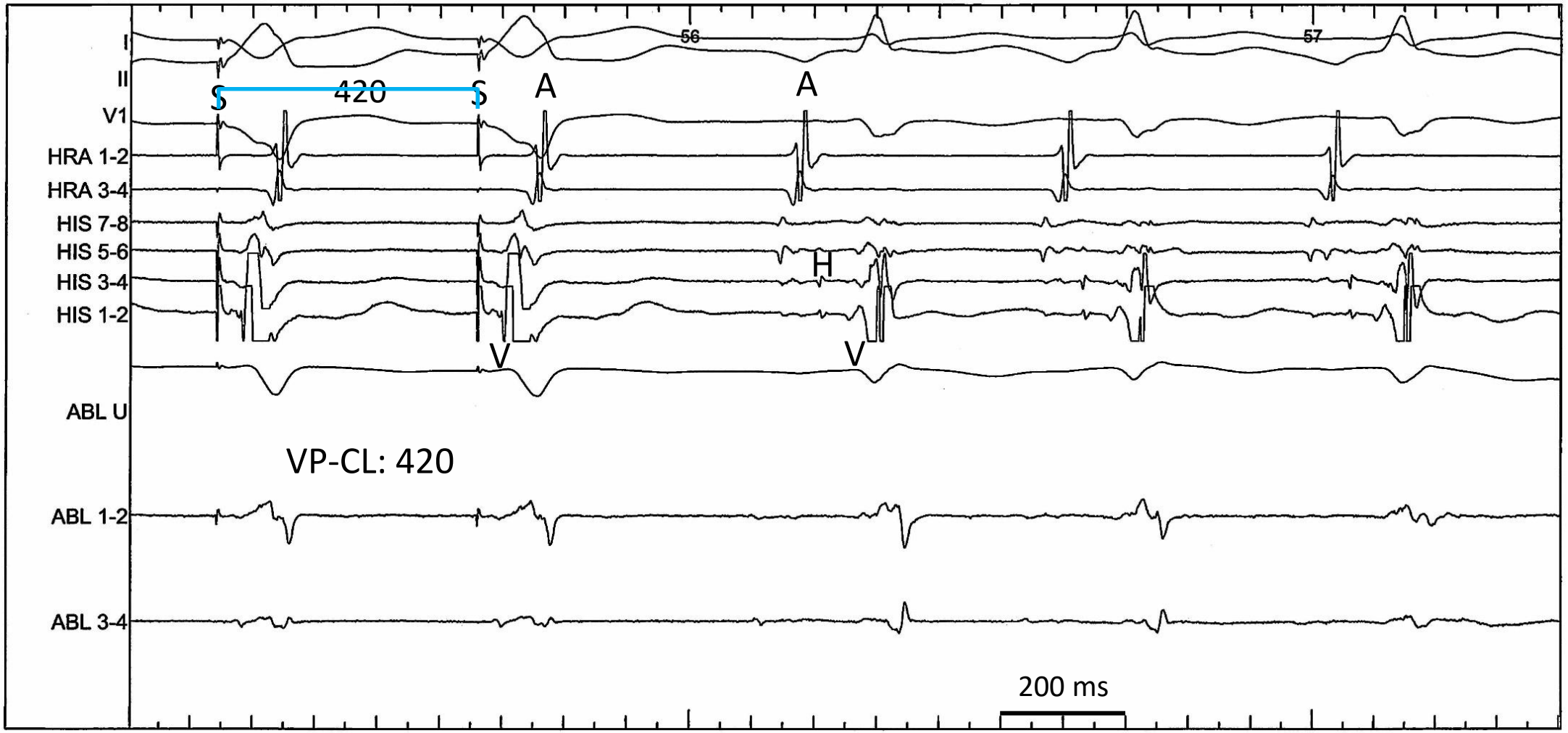
Entrainment from RV Septum during Long R-P’ Tachycardia

V-A-A-V Response



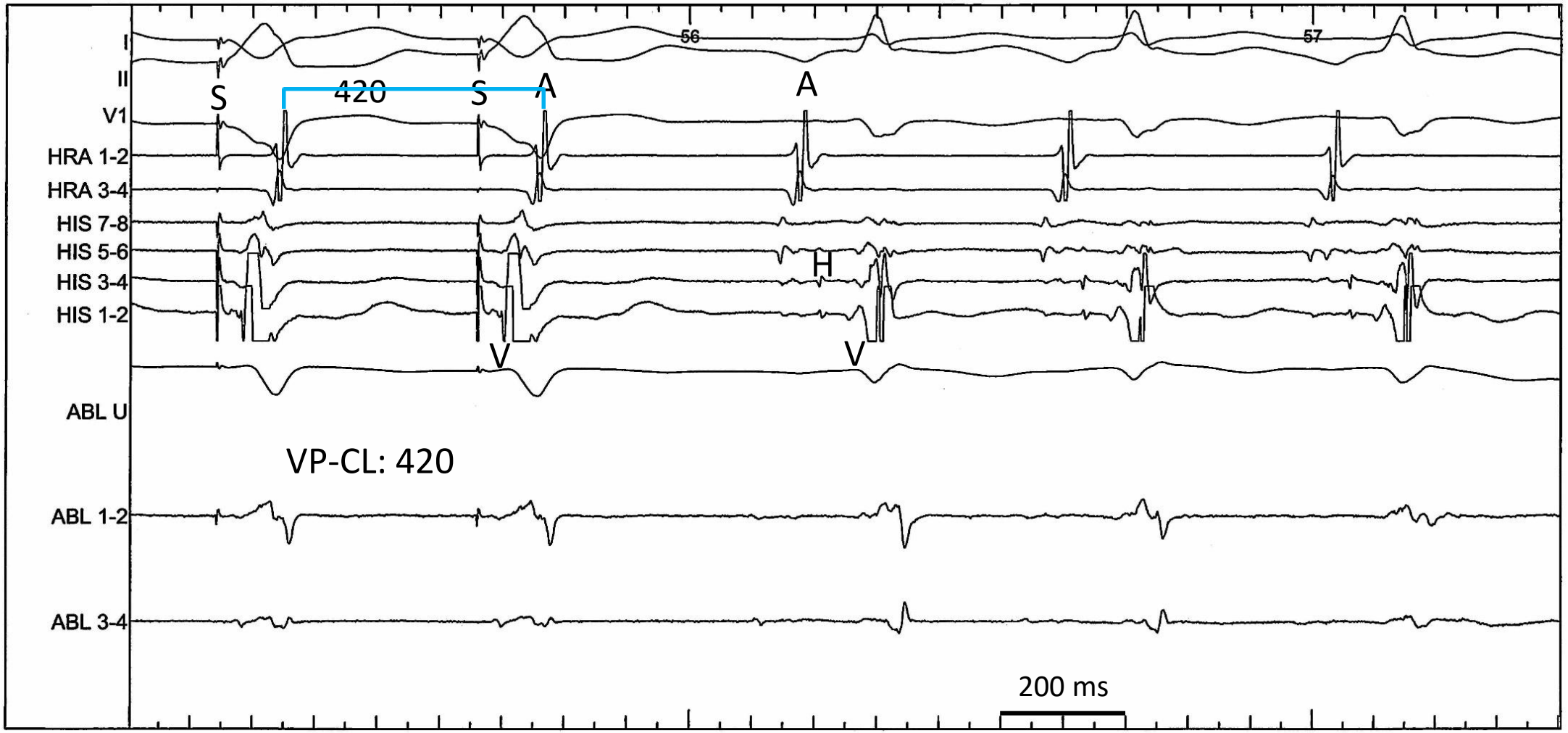
Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

Entrainment from RV Septum during Long R-P’ Tachycardia



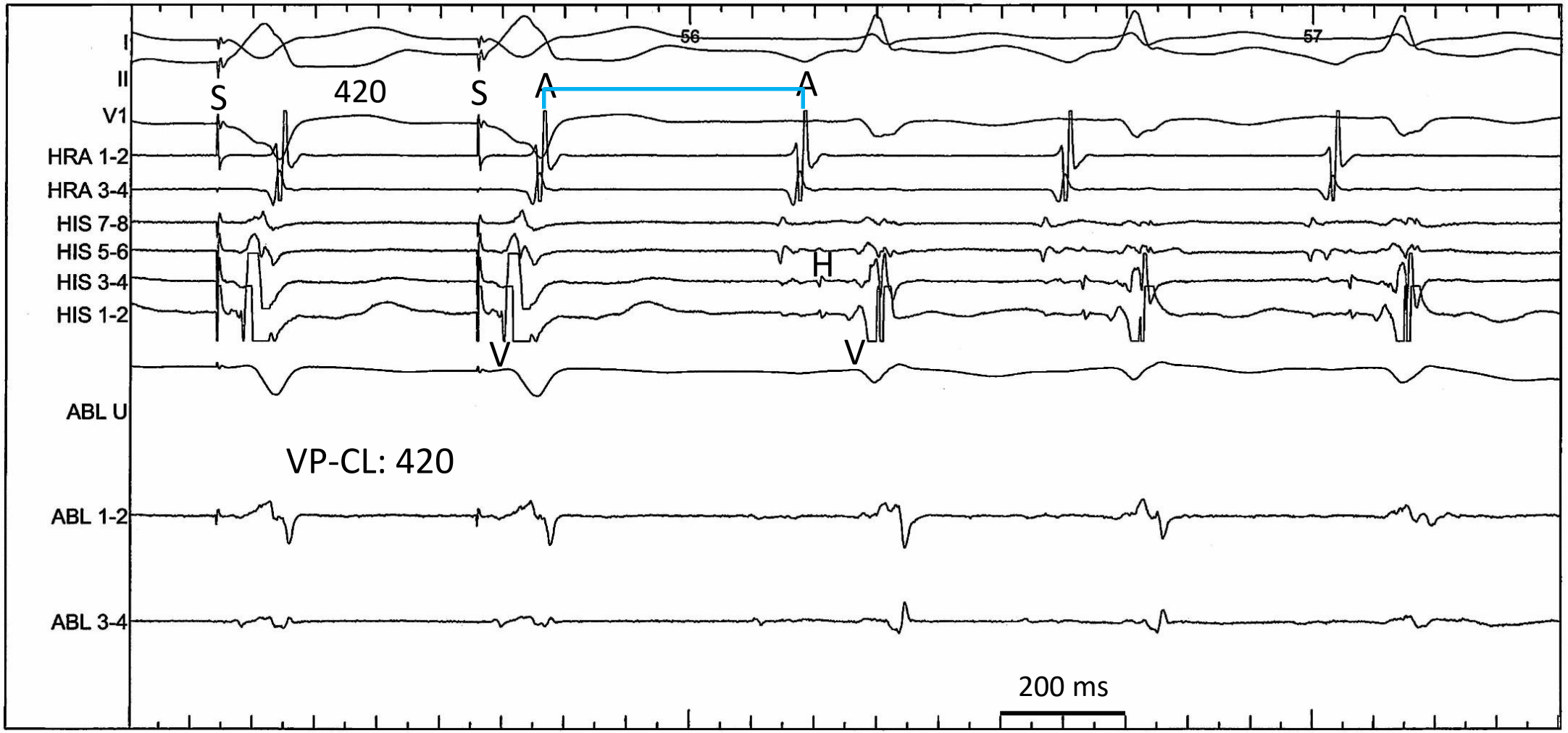
Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

Entrainment from RV Septum during Long R-P’ Tachycardia



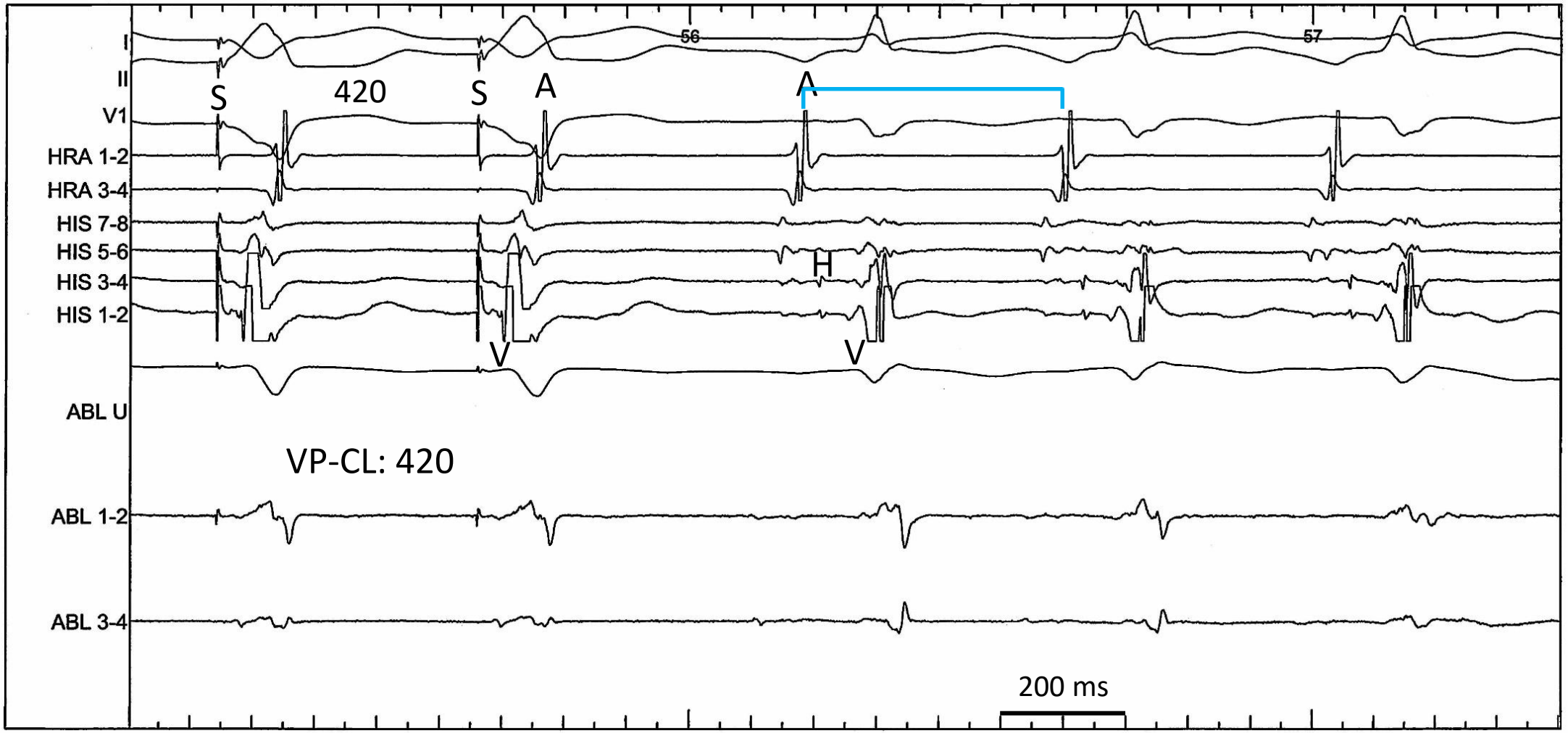
Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

Entrainment from RV Septum during Long R-P’ Tachycardia



Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

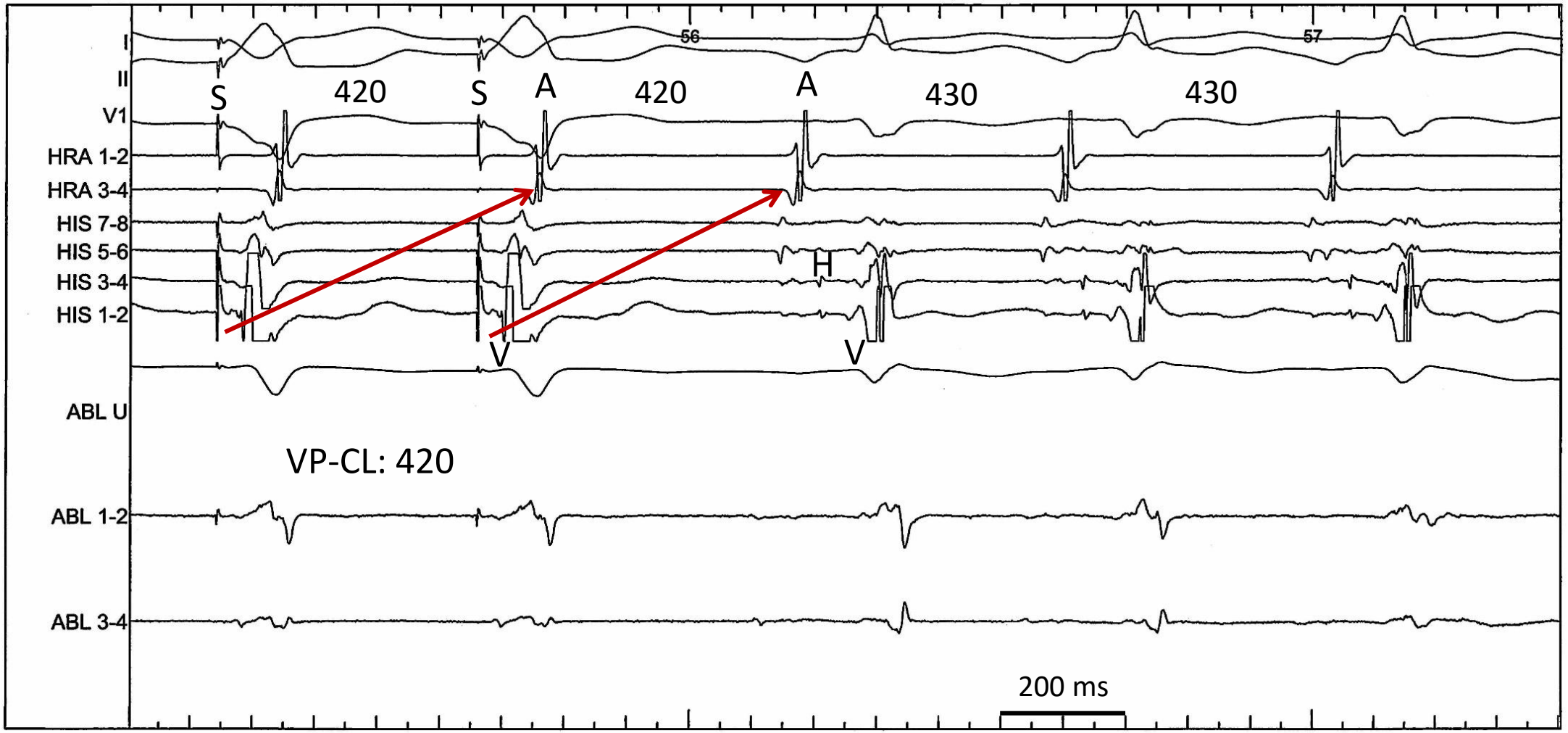
Entrainment from RV Septum during Long R-P’ Tachycardia



Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

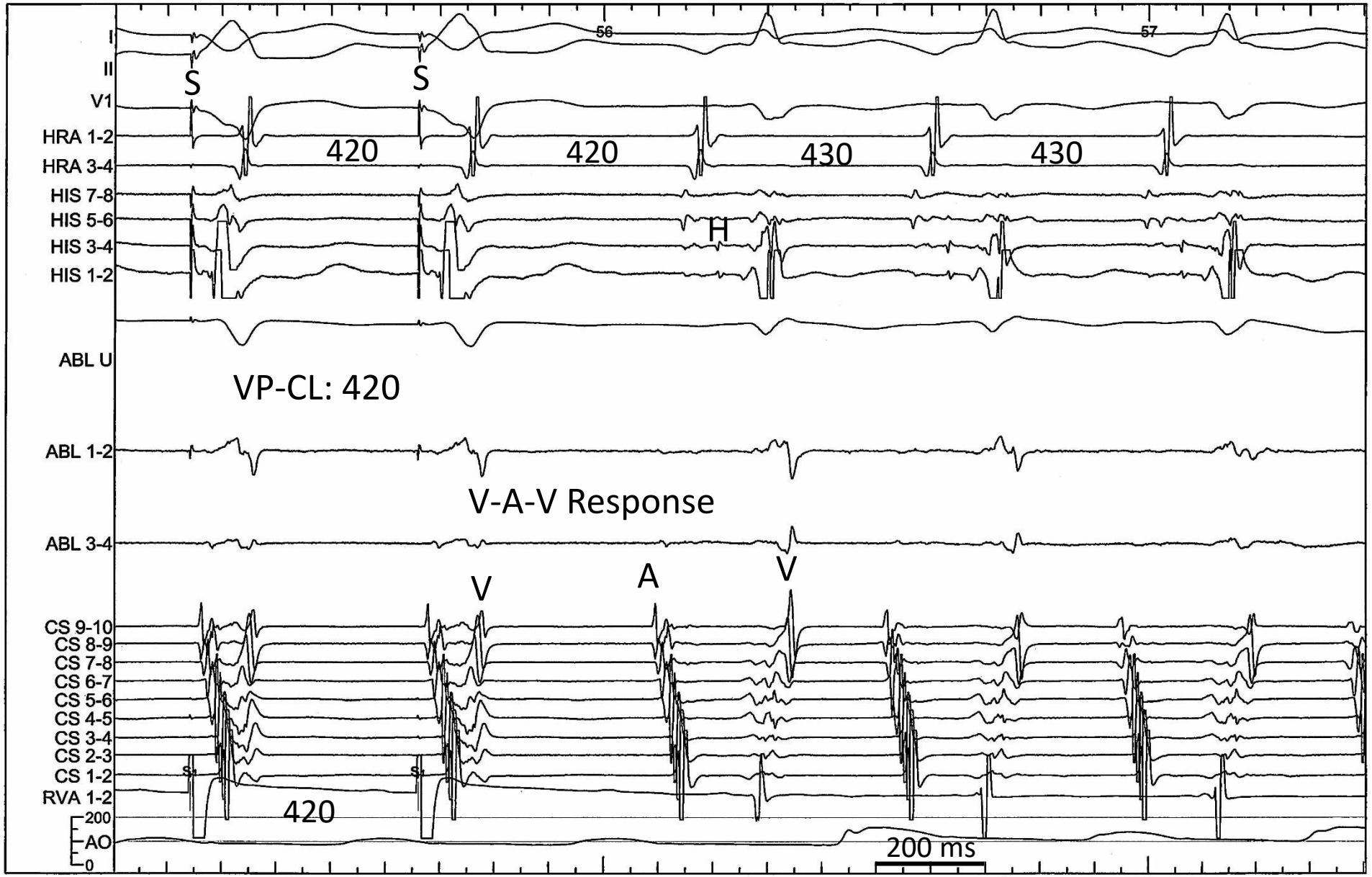
Entrainment from RV Septum during Long R-P' Tachycardia

V-A-V Response (Pseudo V-A-A-V Response)



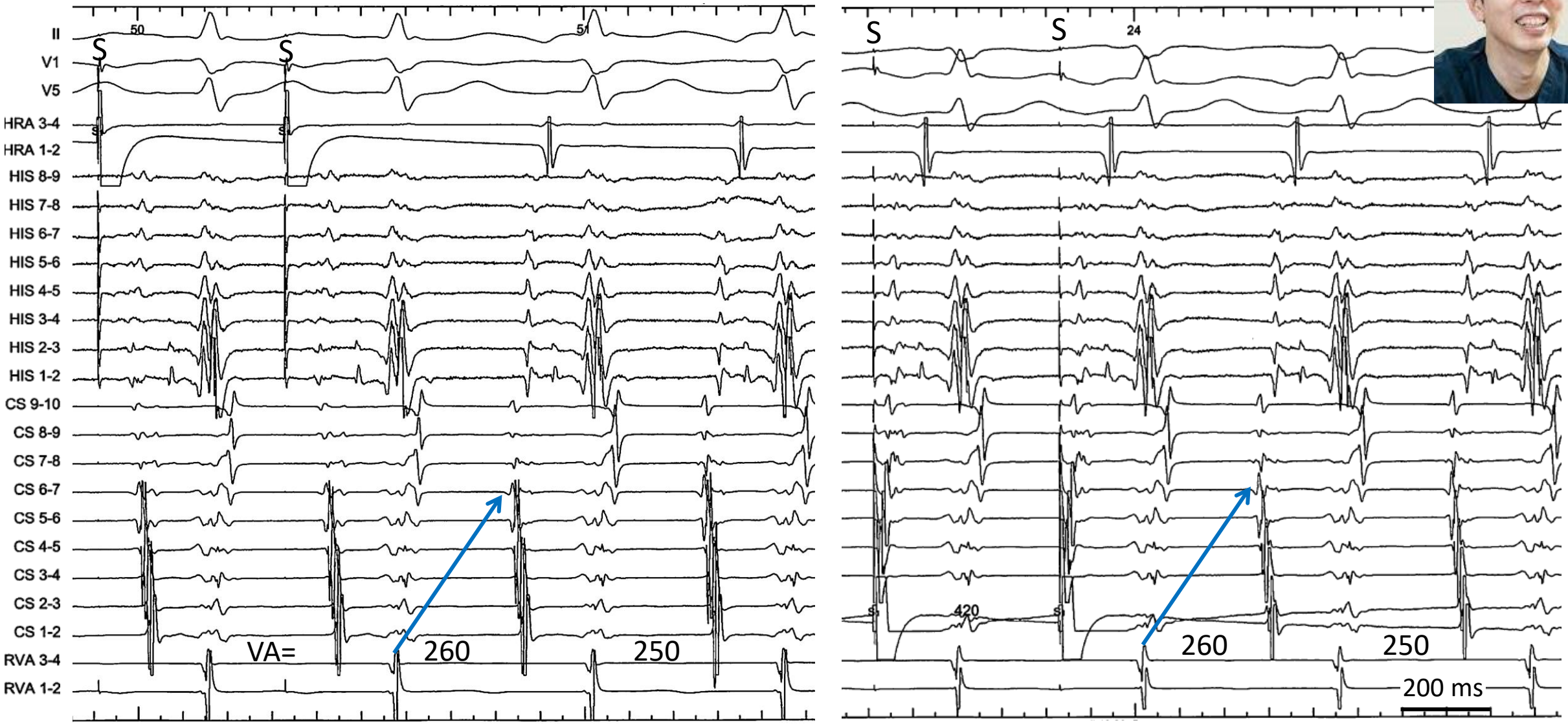
Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

Entrainment from RV Septum during Long R-P’ Tachycardia



心房最早期興奮部位であるCSOSの電位で見るとV-A-V responseであることはすぐにわかります。

V-A Linking



Q5-1. 1. AT 2. AVNRT 3. AVRT 4. わかりません

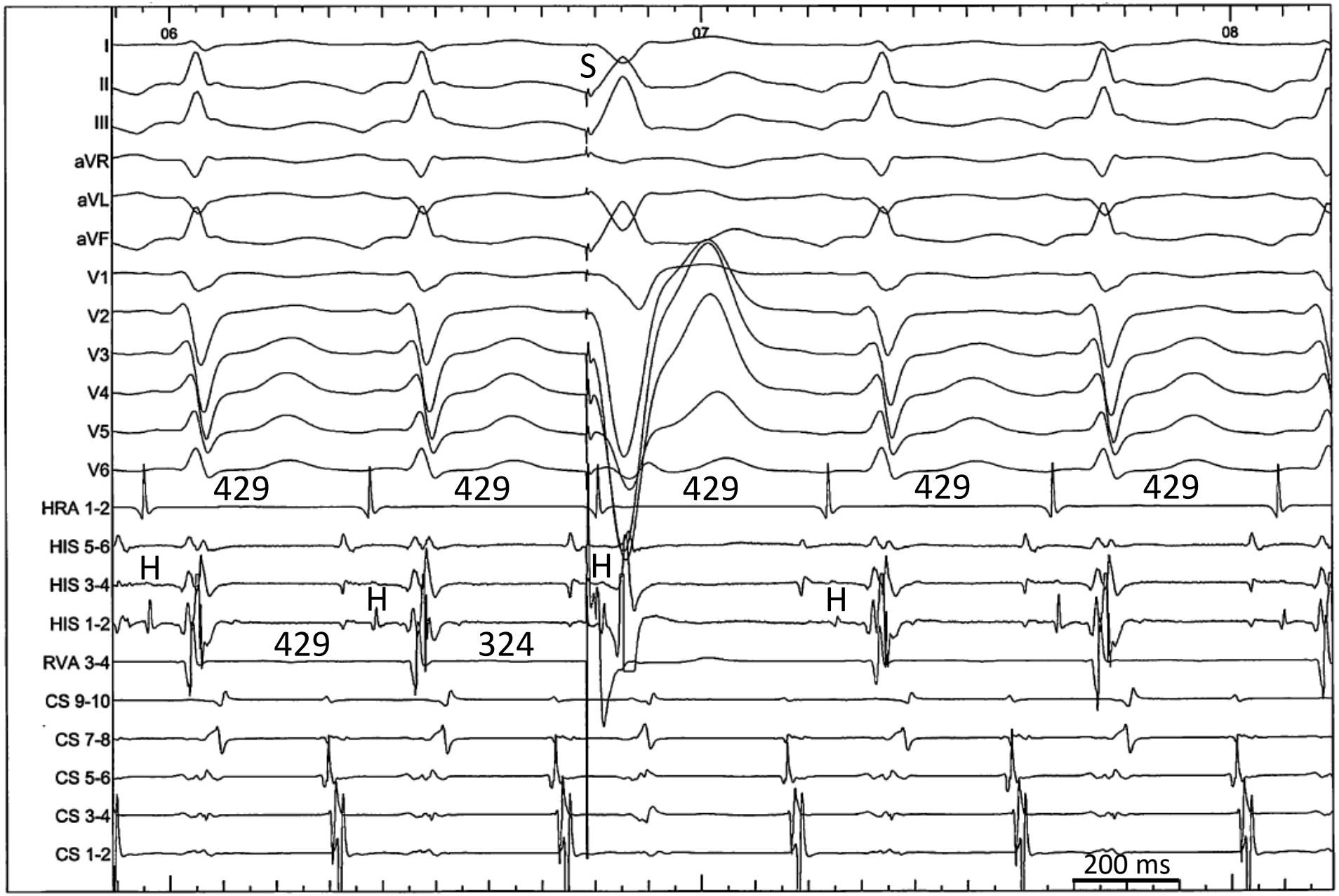
Q5-1: このlong R-P’頻拍の機序は?

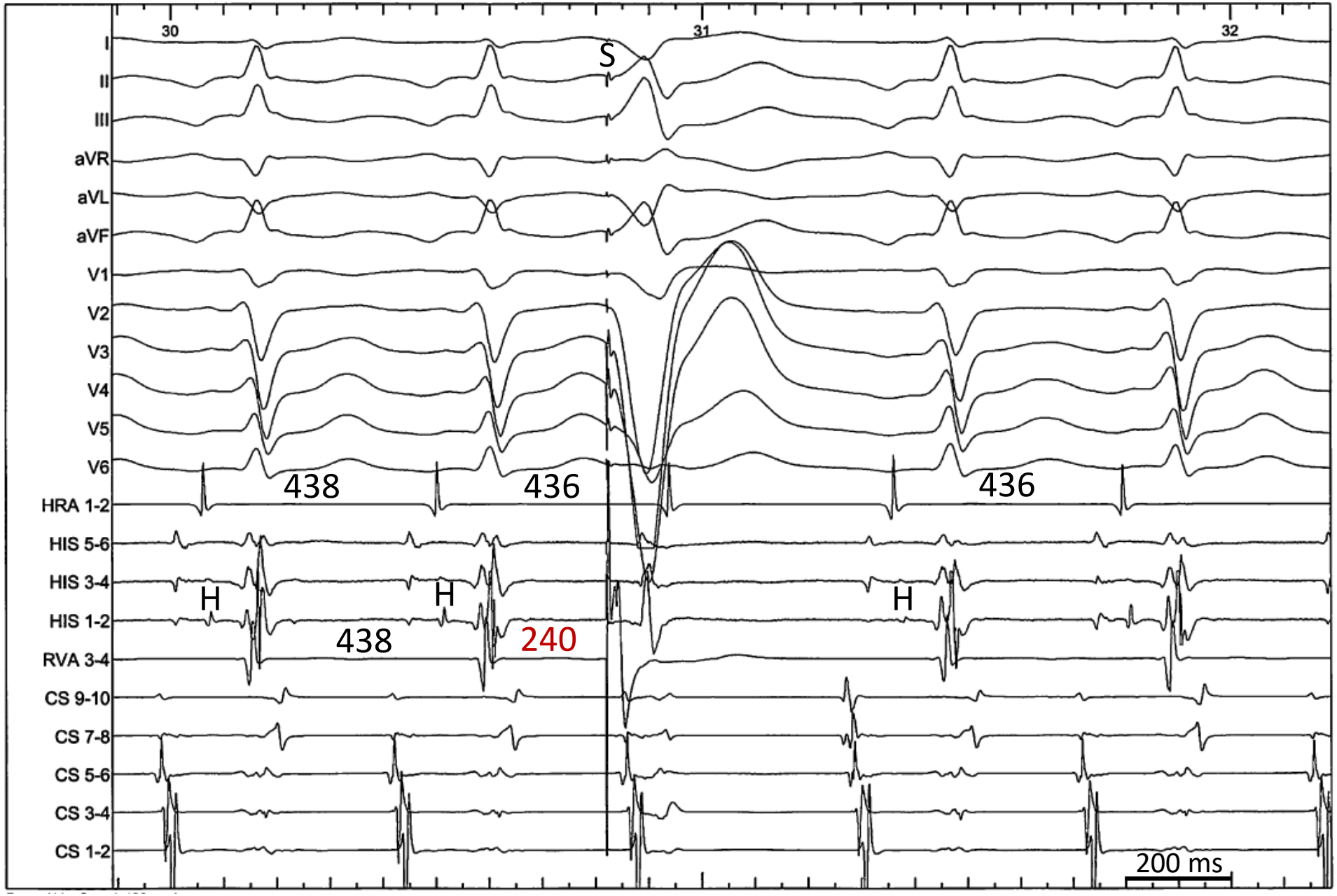
1. Atrial tachycardia
2. AVNRT
3. AVRT (ORT)
4. わかりません

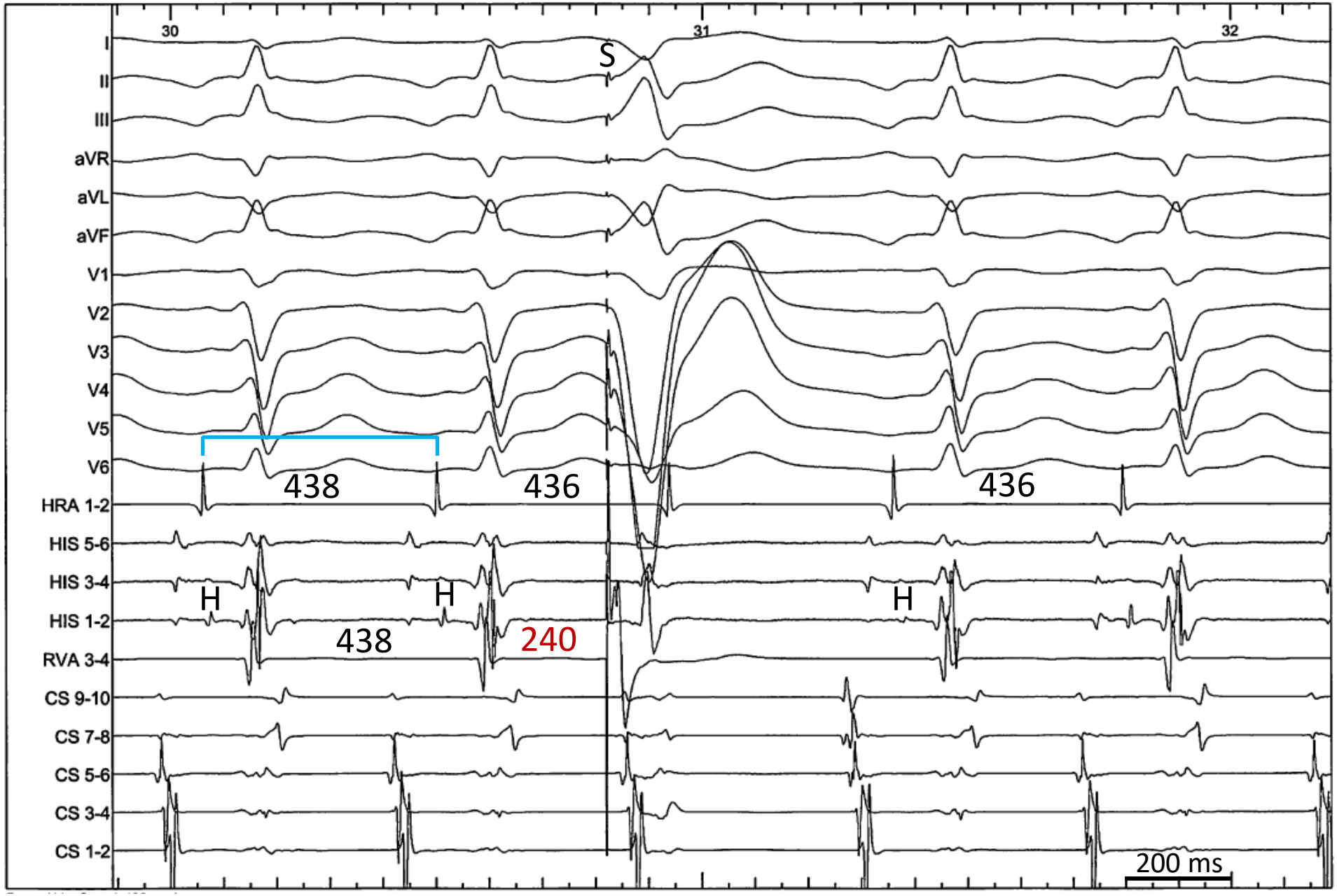
Q5-2: このlong R-P’頻拍の機序は?

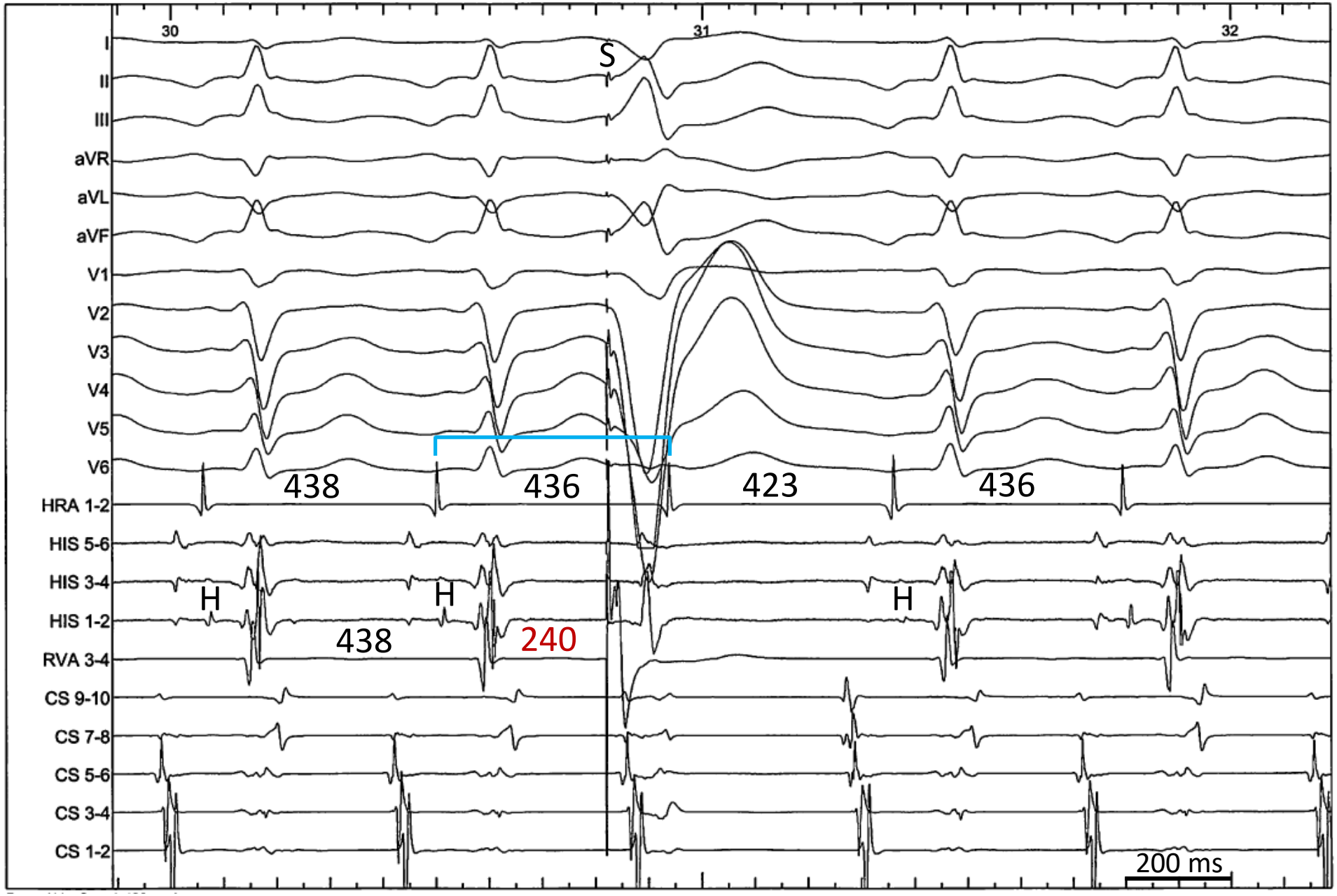
1. AVNRT
2. NF/NV ORT
3. Slow Kent ORT
4. わかりません

V on His


06
07
08
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
HRA 1-2
HIS 5-6
HIS 3-4
HIS 1-2
RVA 3-4
CS 9-10
CS 7-8
CS 5-6
CS 3-4
CS 1-2
S
429
429
429
429
429
H
H
H
H
429
324
200 ms


30
31
32
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
HRA 1-2
HIS 5-6
HIS 3-4
HIS 1-2
RVA 3-4
CS 9-10
CS 7-8
CS 5-6
CS 3-4
CS 1-2
S
438
436
436
H
H
H
438
240
200 ms


30
31
32
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
HRA 1-2
HIS 5-6
HIS 3-4
HIS 1-2
RVA 3-4
CS 9-10
CS 7-8
CS 5-6
CS 3-4
CS 1-2
S
438
436
436
H
H
H
438
240
200 ms

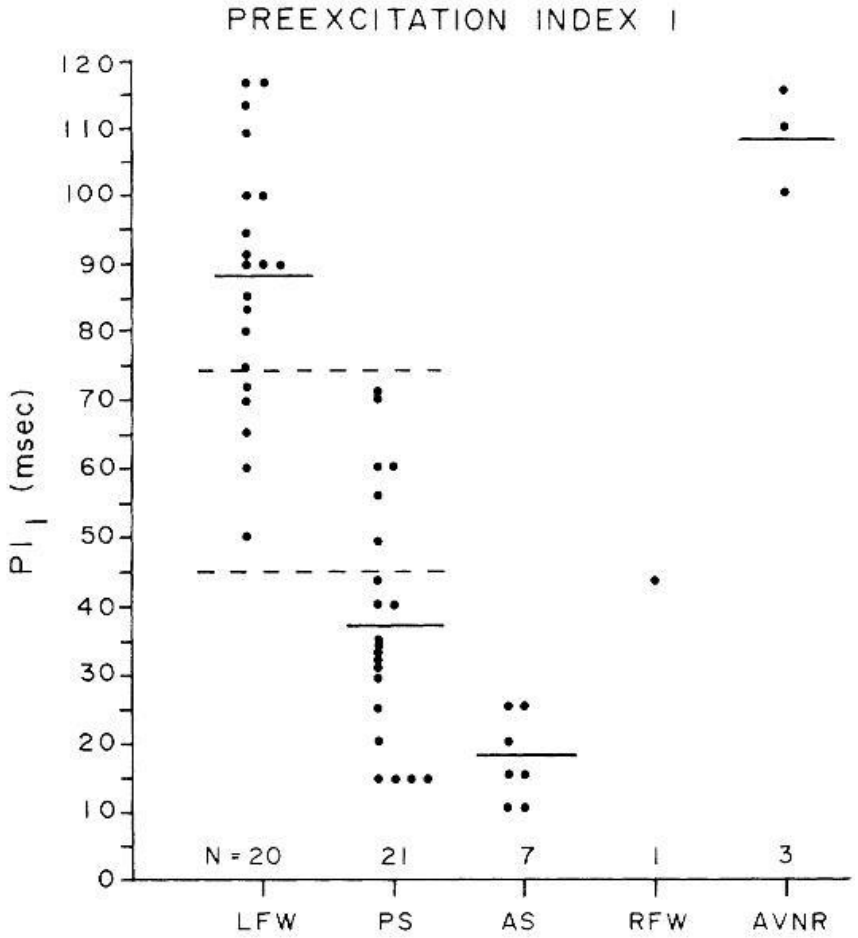


Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません

The preexcitation index: an aid in determining the mechanism of supraventricular tachycardia and localizing accessory pathways

Circulation 74, No. 3, 493–500, 1986.

WILLIAM M. MILES, M.D., RAYMOND YEE, M.D., GEORGE J. KLEIN, M.D., DOUGLAS P. ZIPES, M.D., AND ERIC N. PRYSTOWSKY, M.D.

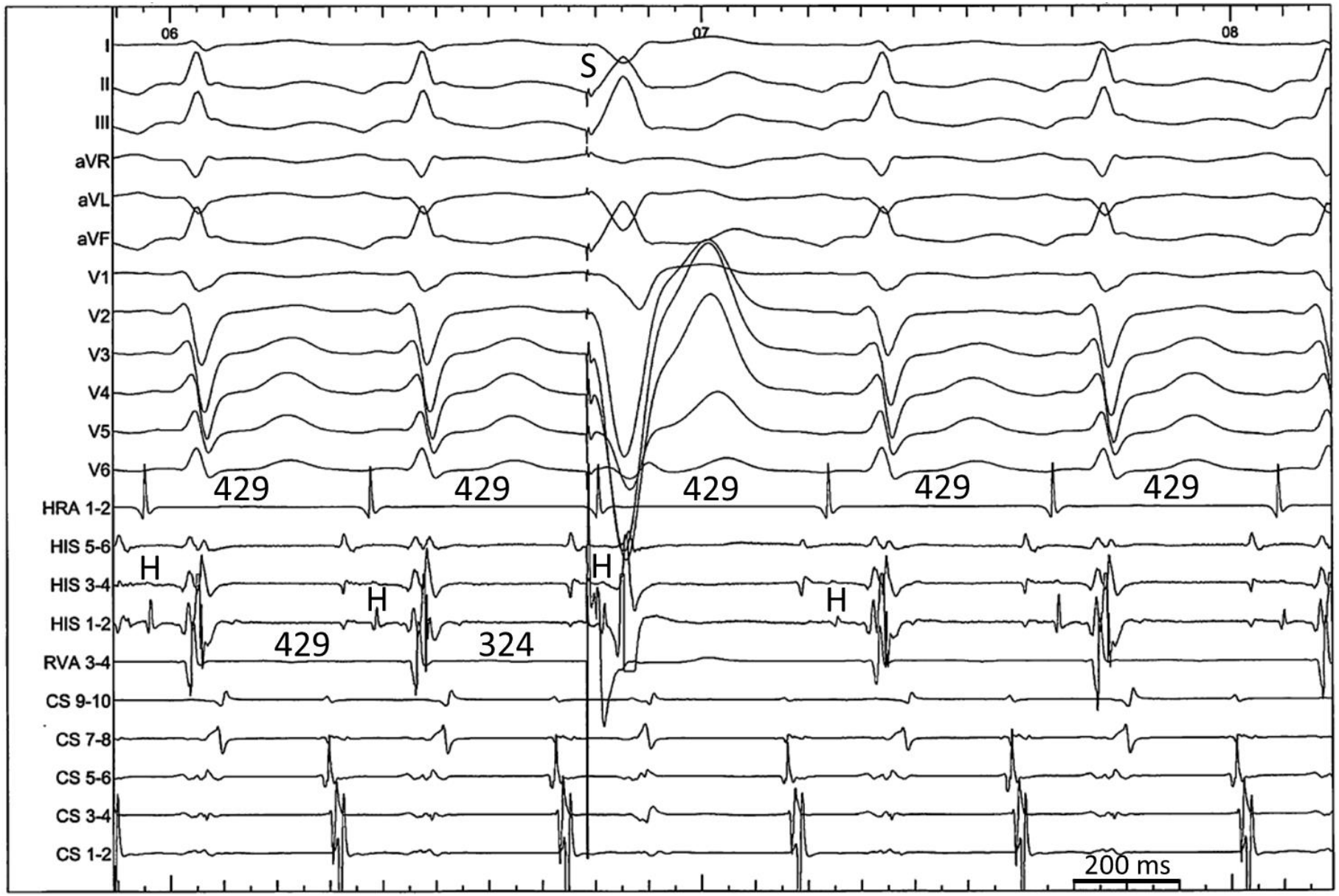


Preexcitation Index (PI)

- [頻拍周期]ー[逆伝導をリセットする最長の連結期]
- AVNRTでも短い連結期ならリセットできる（PIは長）
- “His不応期”だと, PI = 0 - 45 msぐらい
  しかし中隔ACPでも一部ではPI 45 ms以上
- PI 75 ms未満であれば中隔ACP
- 左側自由壁ACPだとPIきわめて長いこともある

本症例では PI = 436-240 = 196

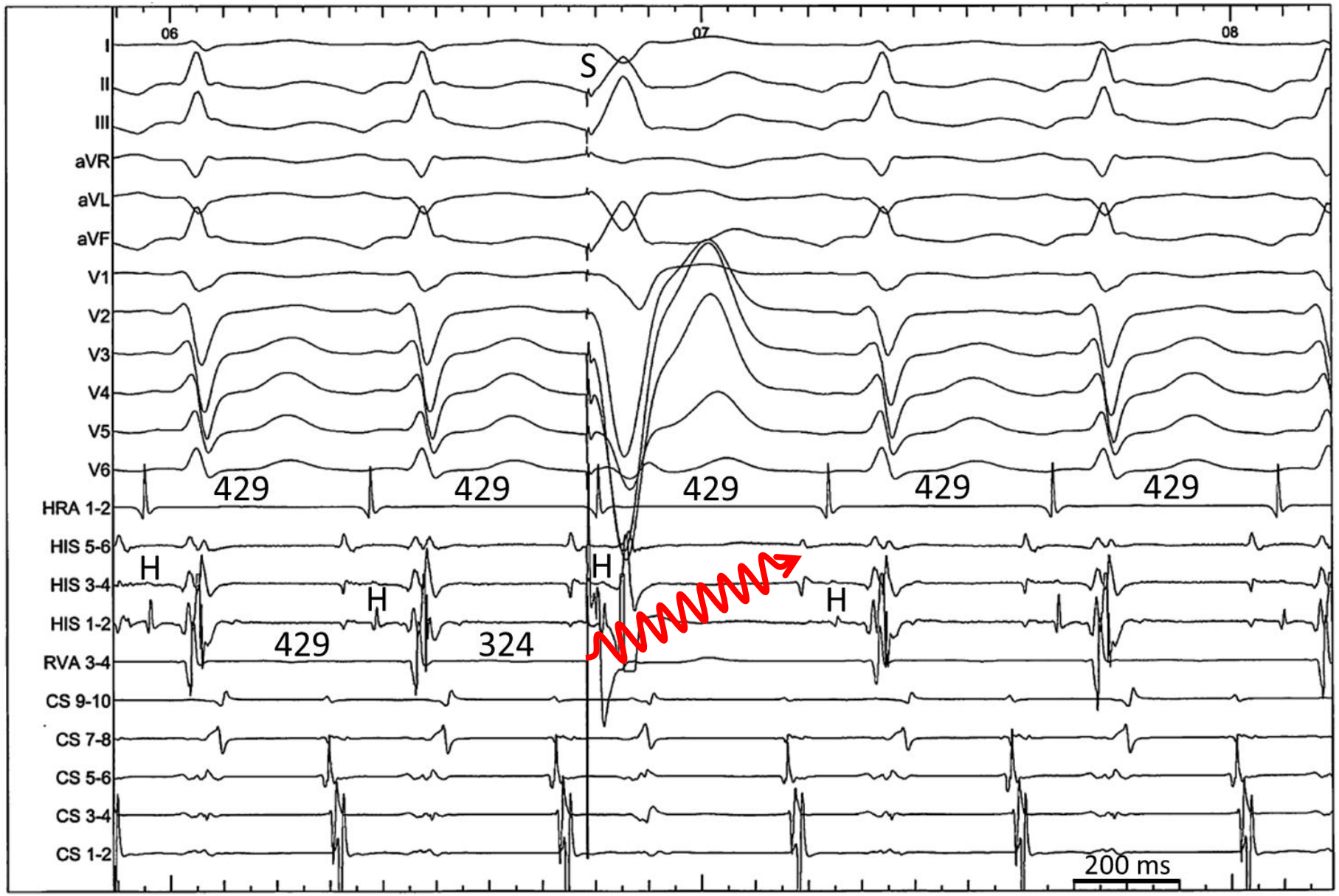
V on His



よくできました

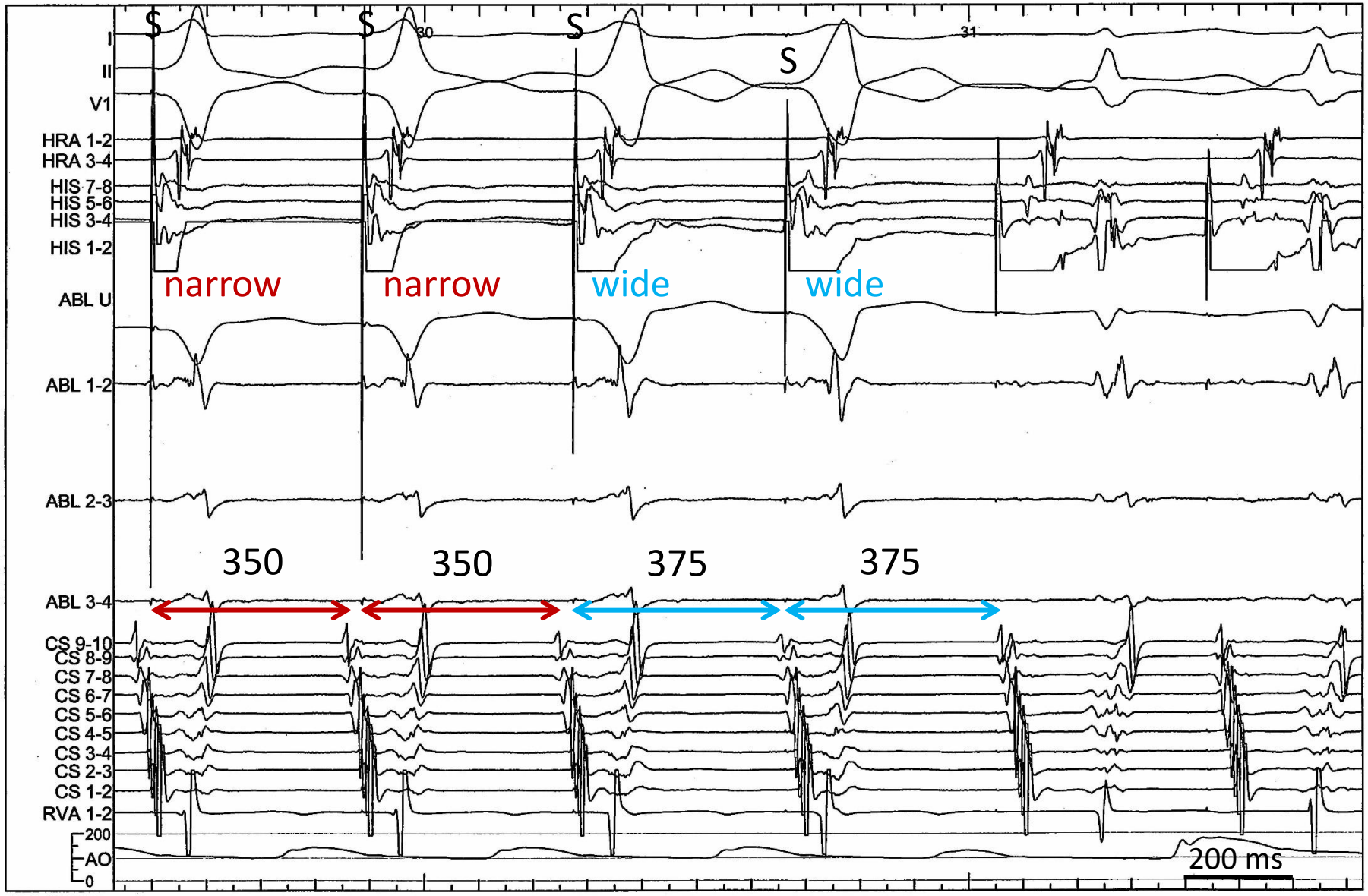
Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません

V on His



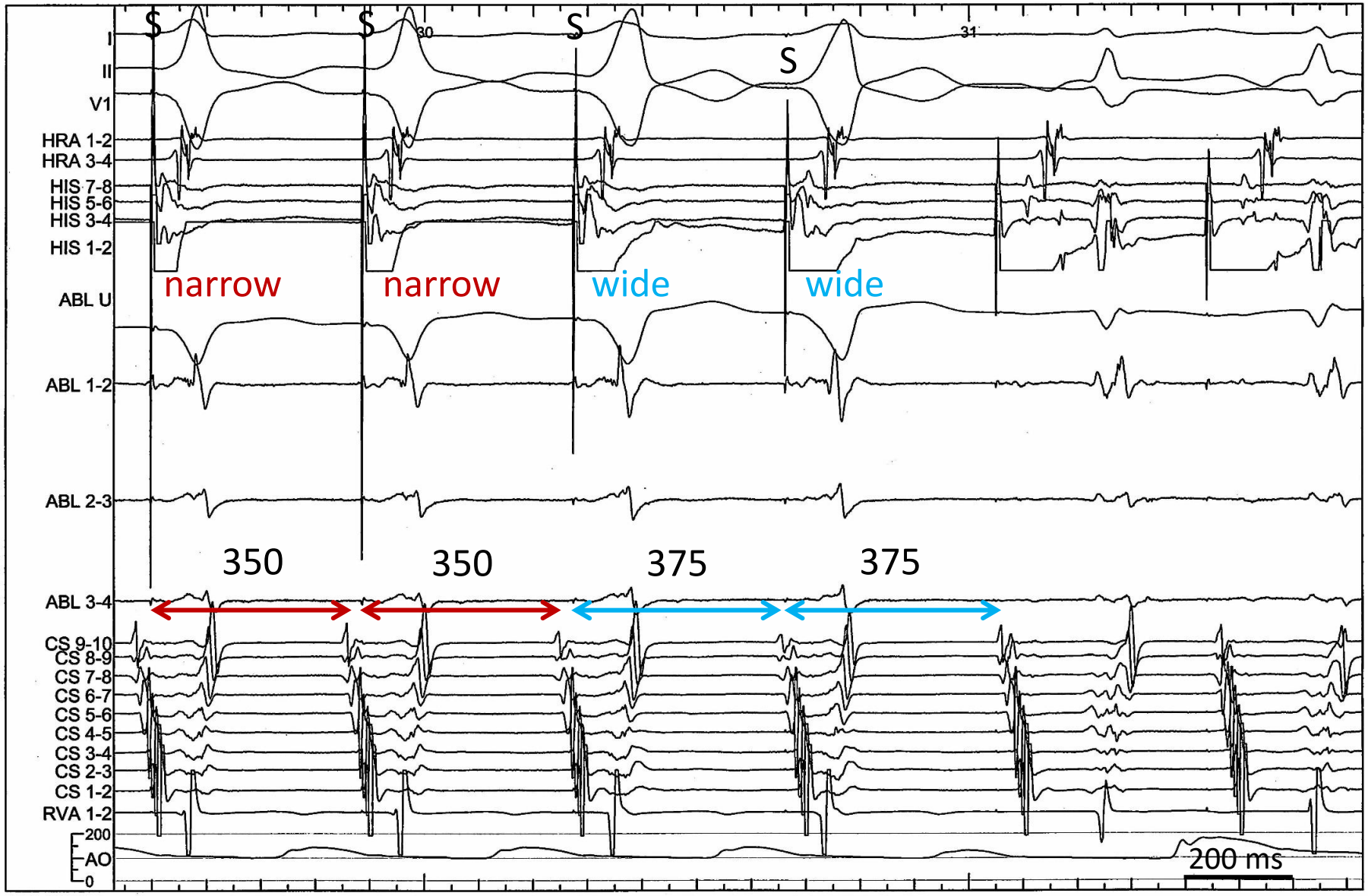
でも，ACPでもNV/NFやslow Kentのように逆伝導に減衰伝導あればS-A延びて，一見心房捕捉なしに見えるかも。

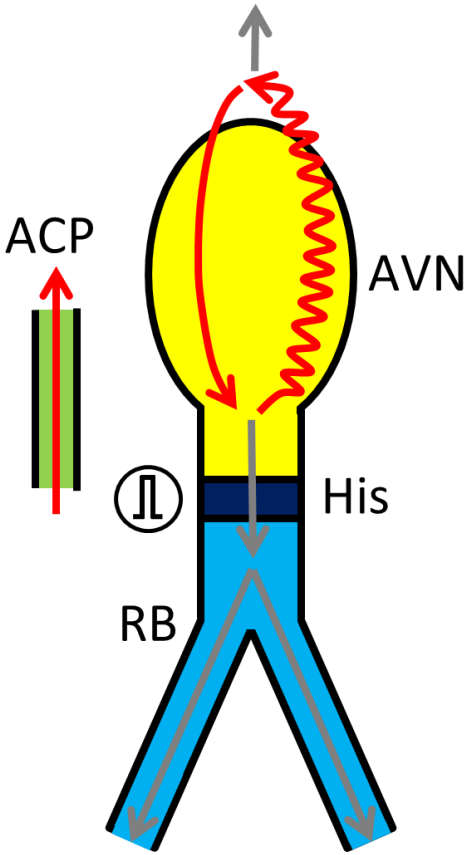
Para-Hisian Entrainment



Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません

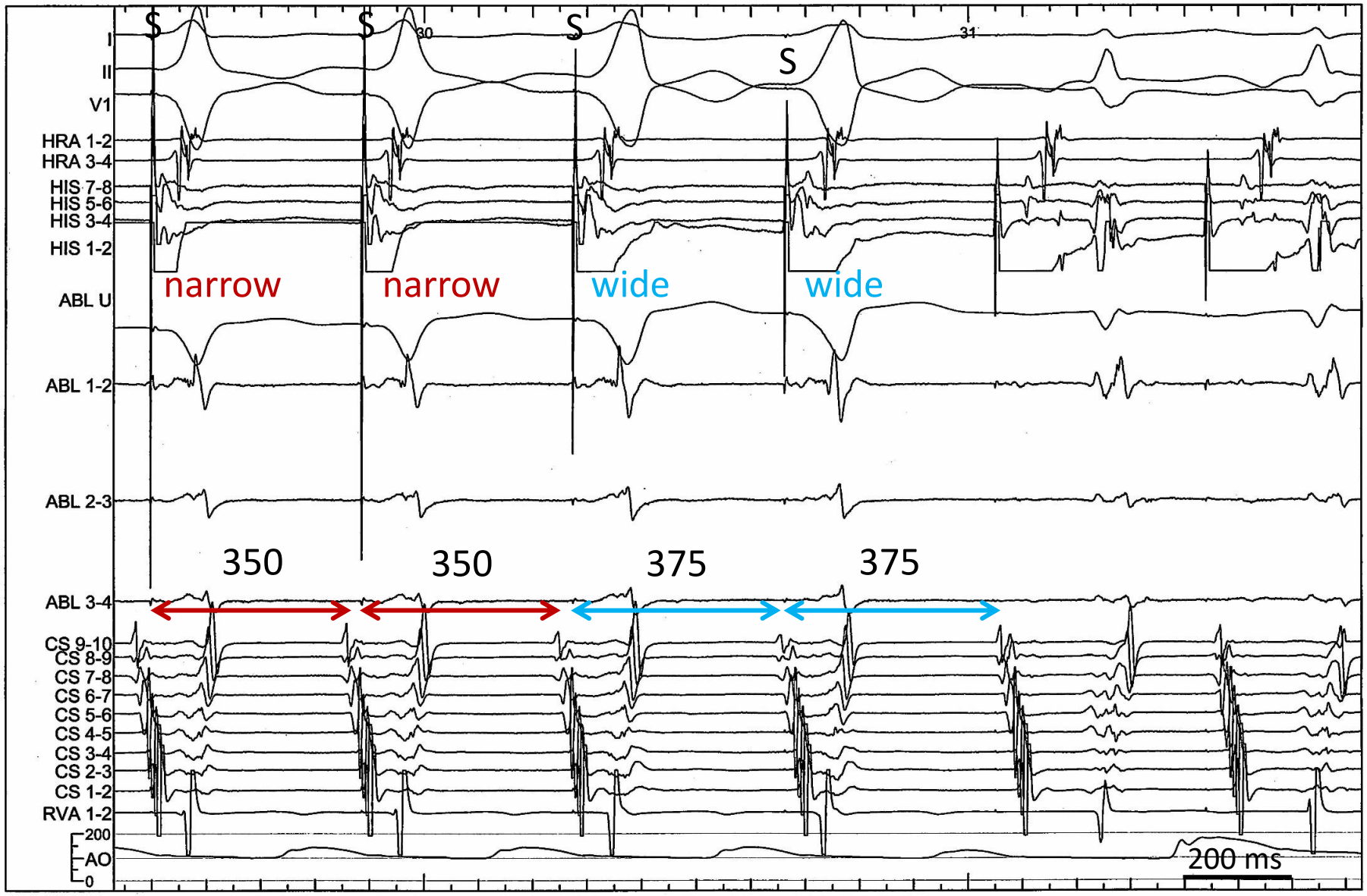
Para-Hisian Entrainment

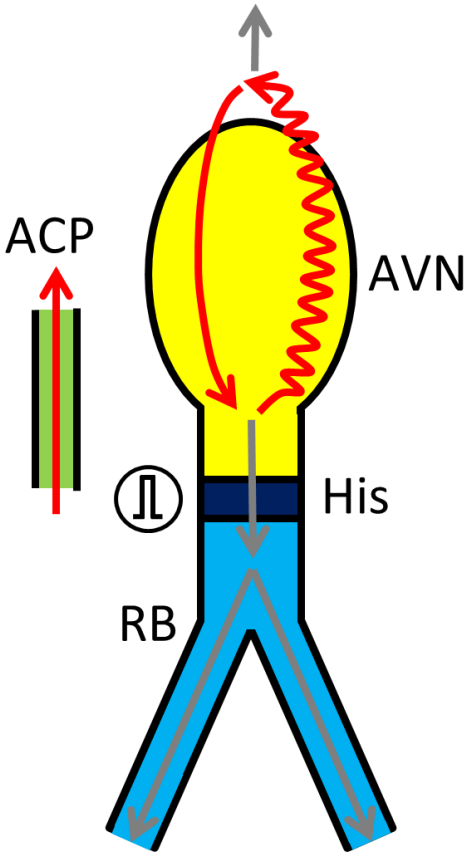




Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません

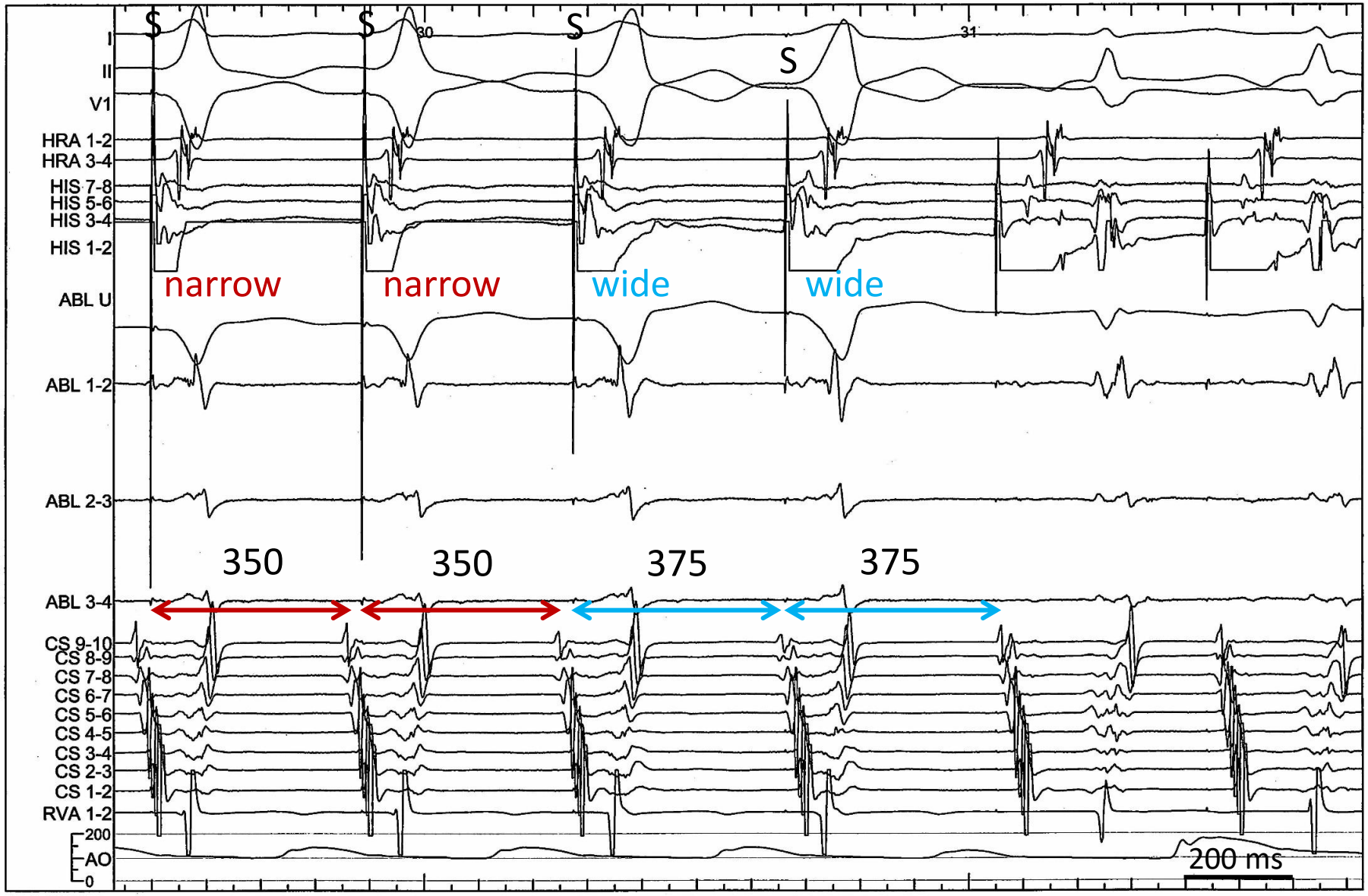
Para-Hisian Entrainment

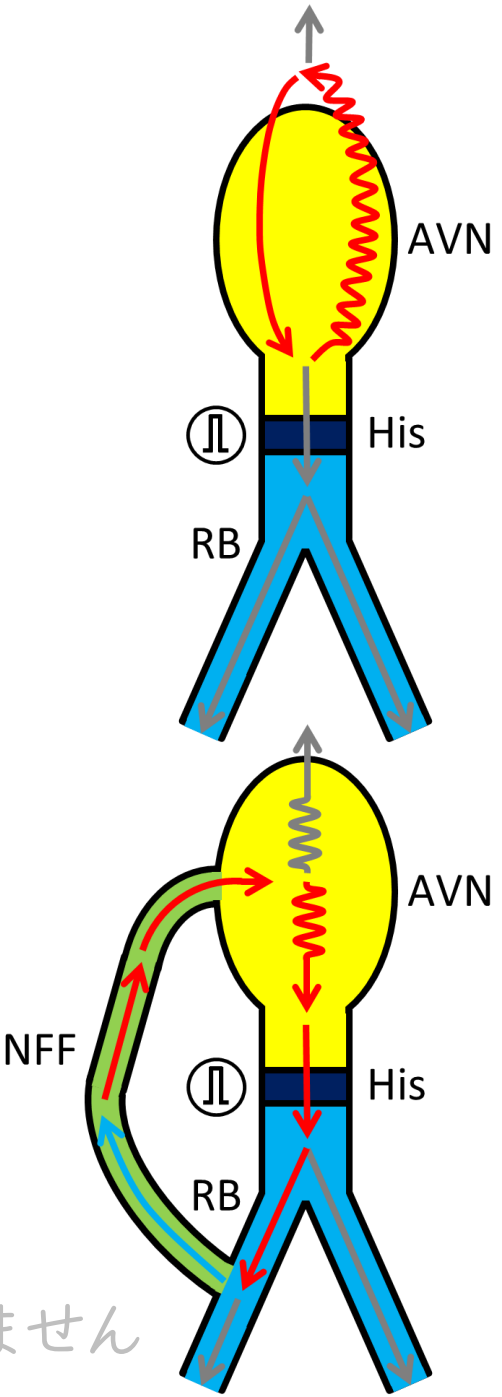




Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません

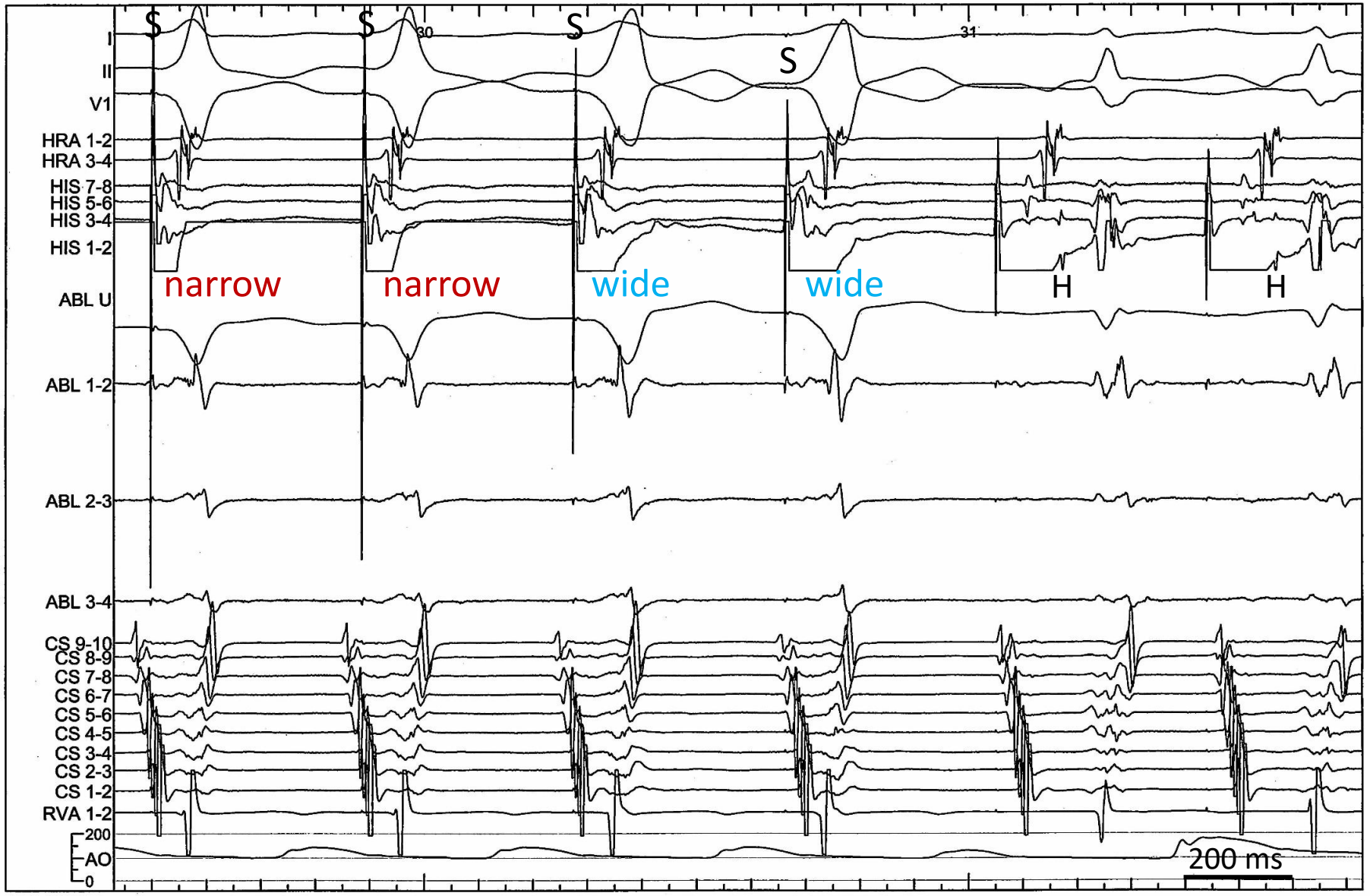
Para-Hisian Entrainment

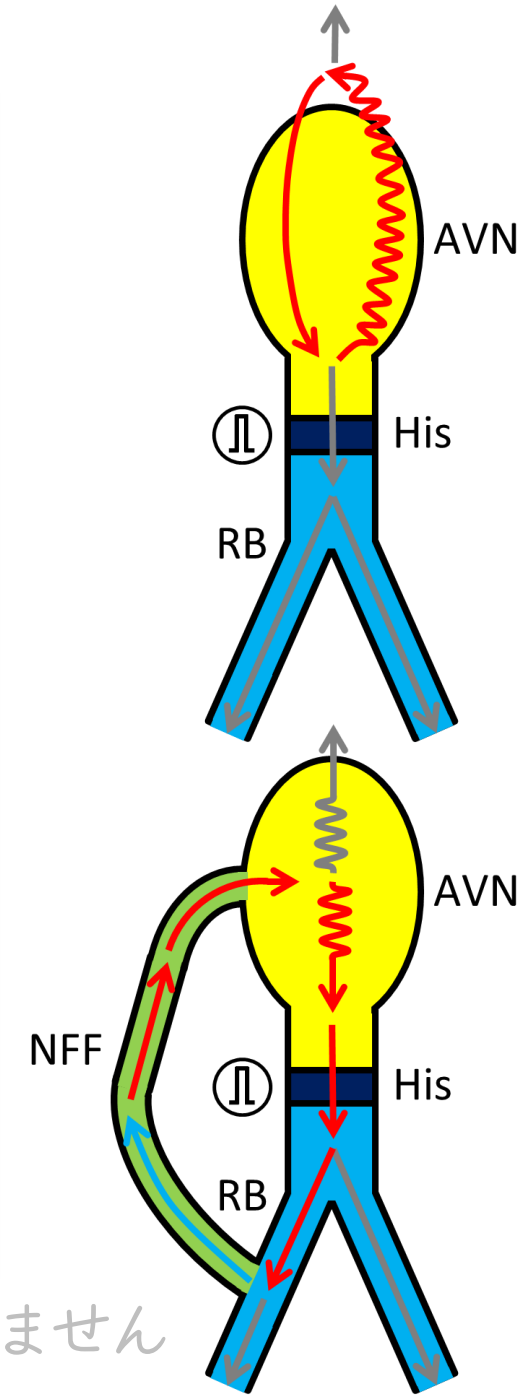




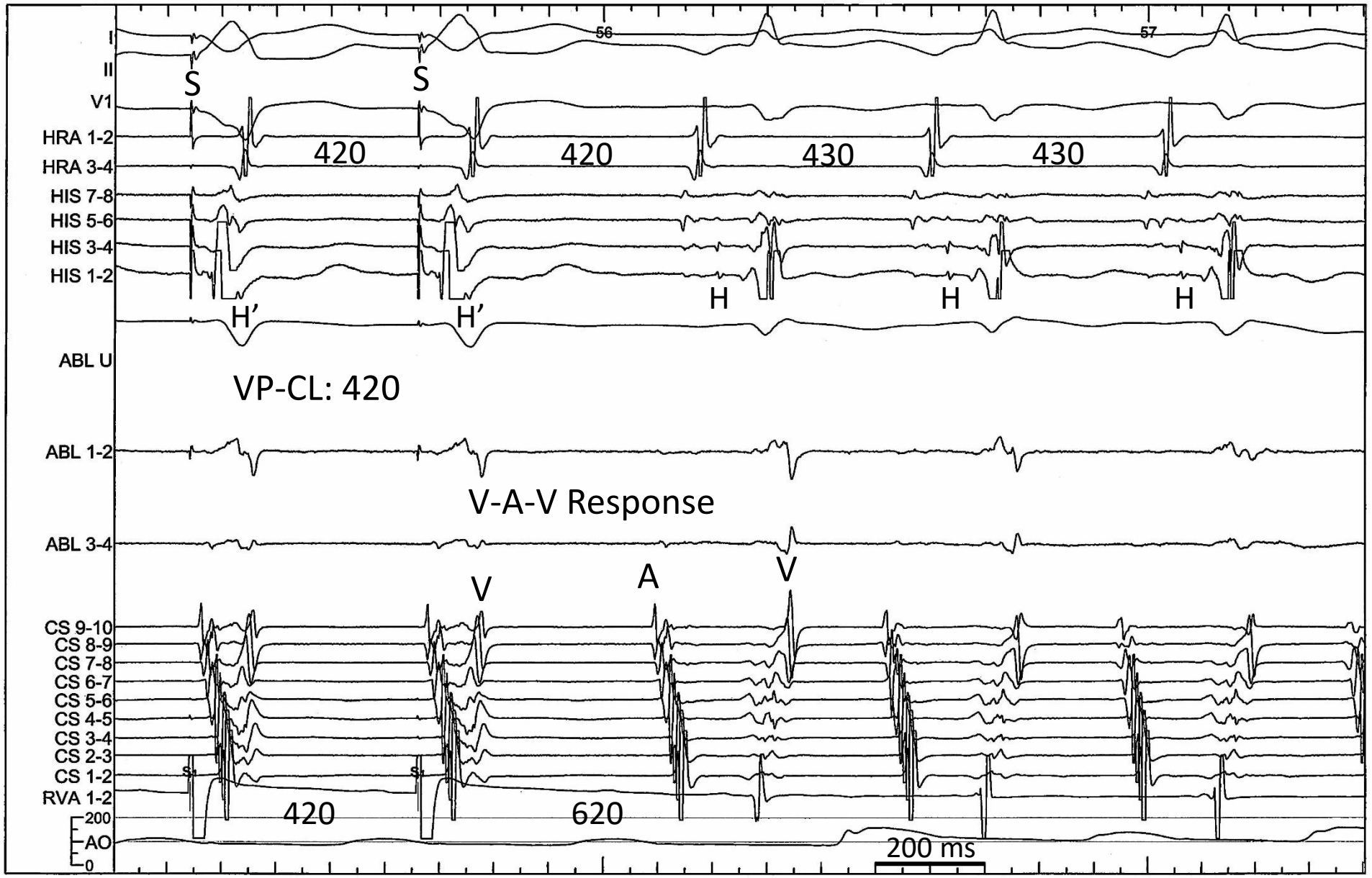
Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません

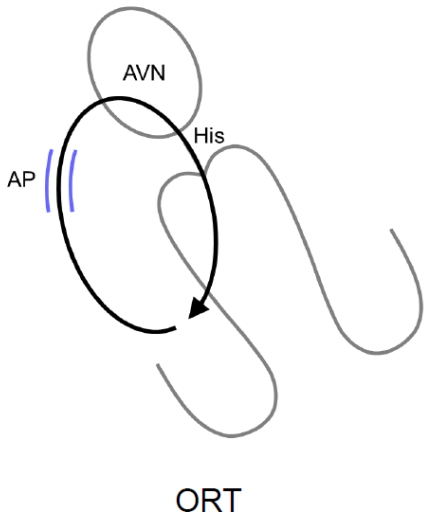
Para-Hisian Entrainment



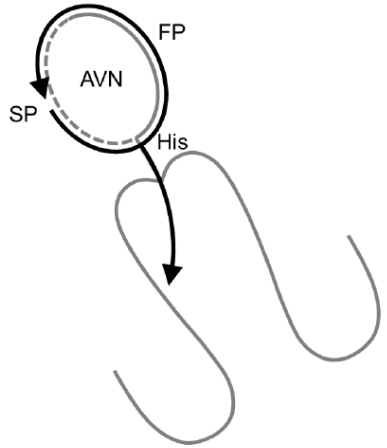


Q5-2. 1. AVNRT 2. NF/NV ORT 3. Slow Kent ORT 4. わかりません





ORT



AVNRT

実は初めのトレース1枚で鑑別は可能でした。
RVからのエントレイン中にHisはantidromicに捕捉されています。そして, PPIはとても長いです。

Q5-2: このlong R-P’頻拍の機序は?

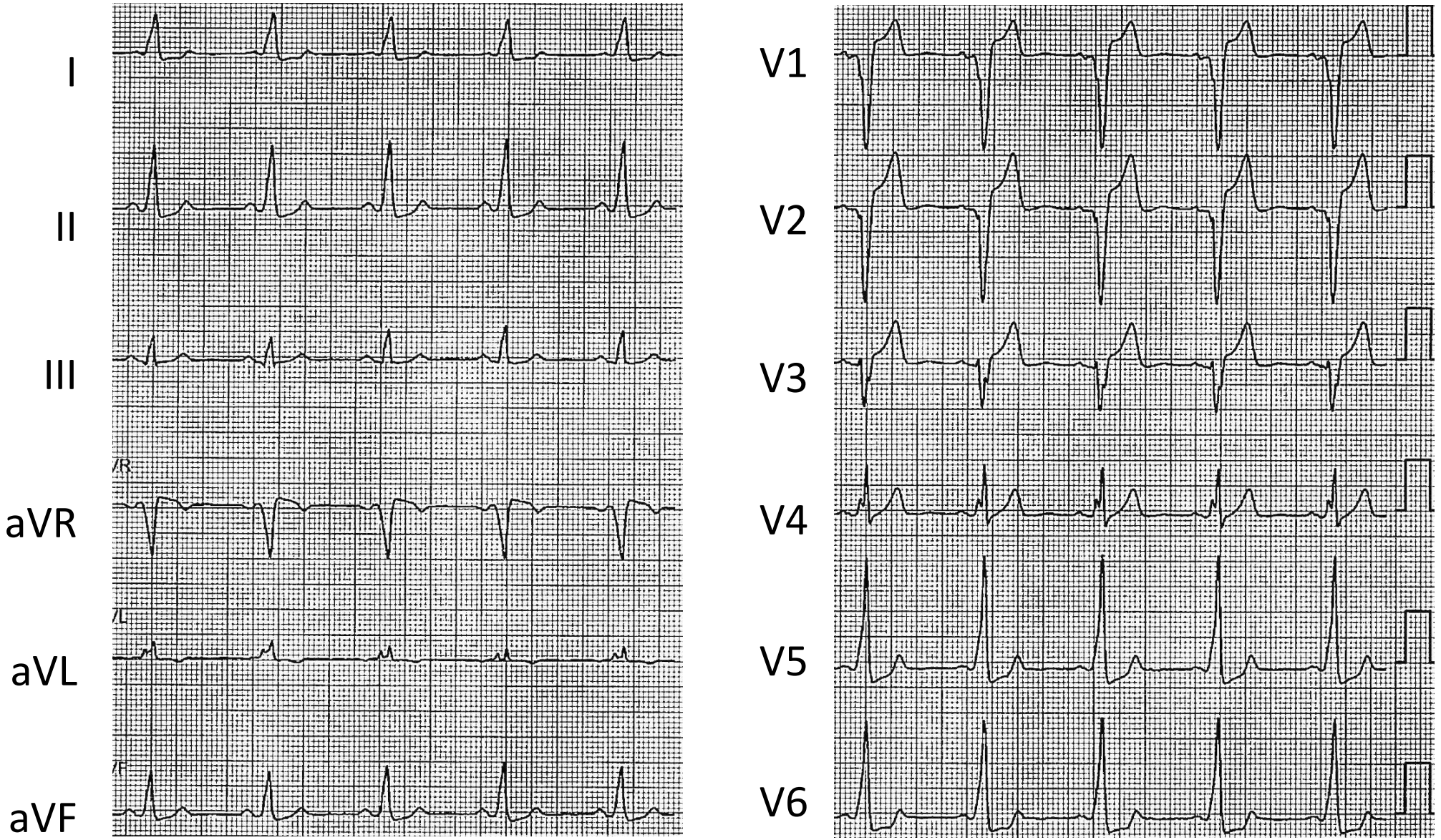
1. AVNRT
2. NF/NV ORT
3. Slow Kent ORT
4. わかりません

Case 6

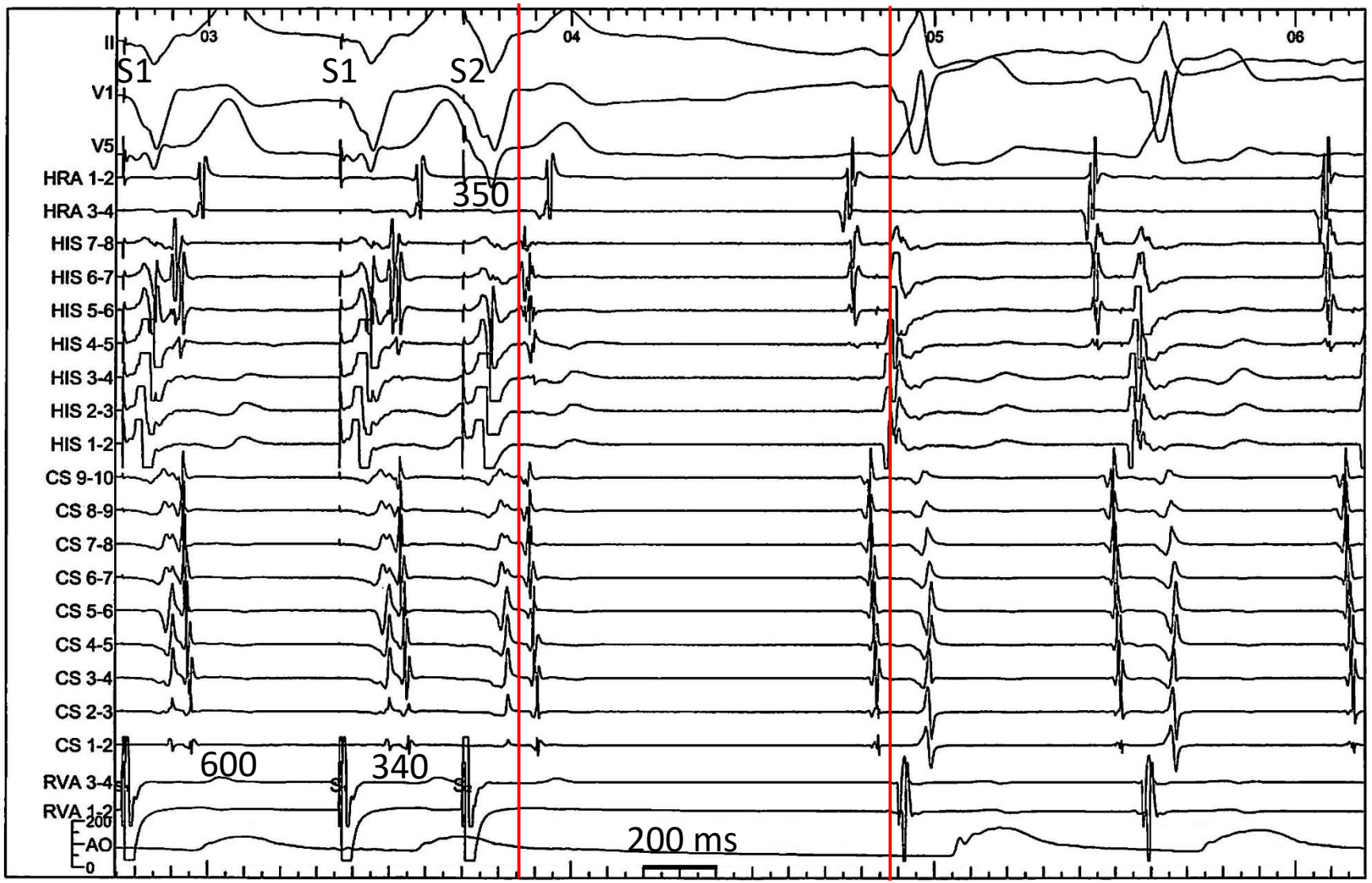
この患者の診断は？

76M with Delta wave and syncope

76岁男性, 失神

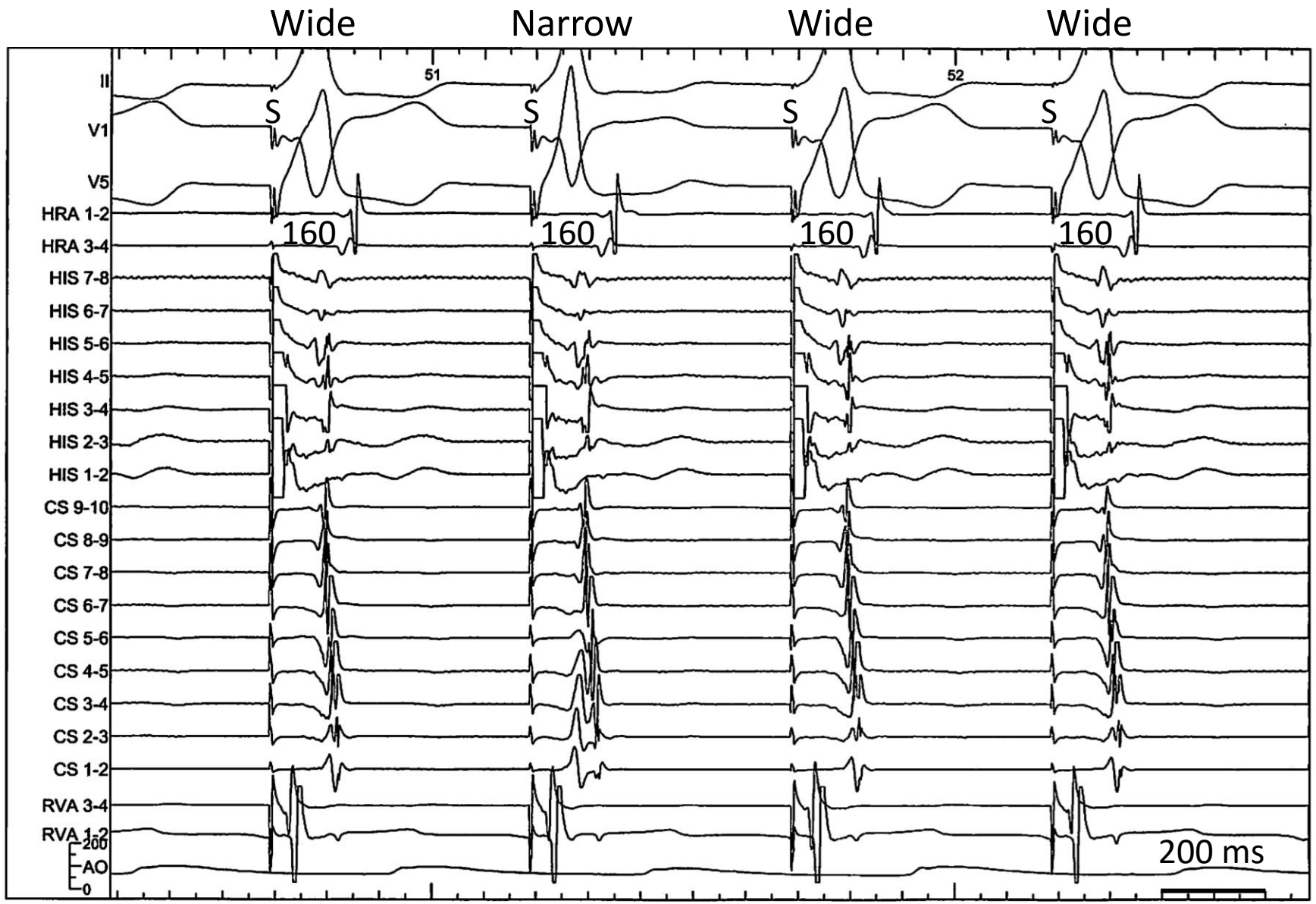


PVS

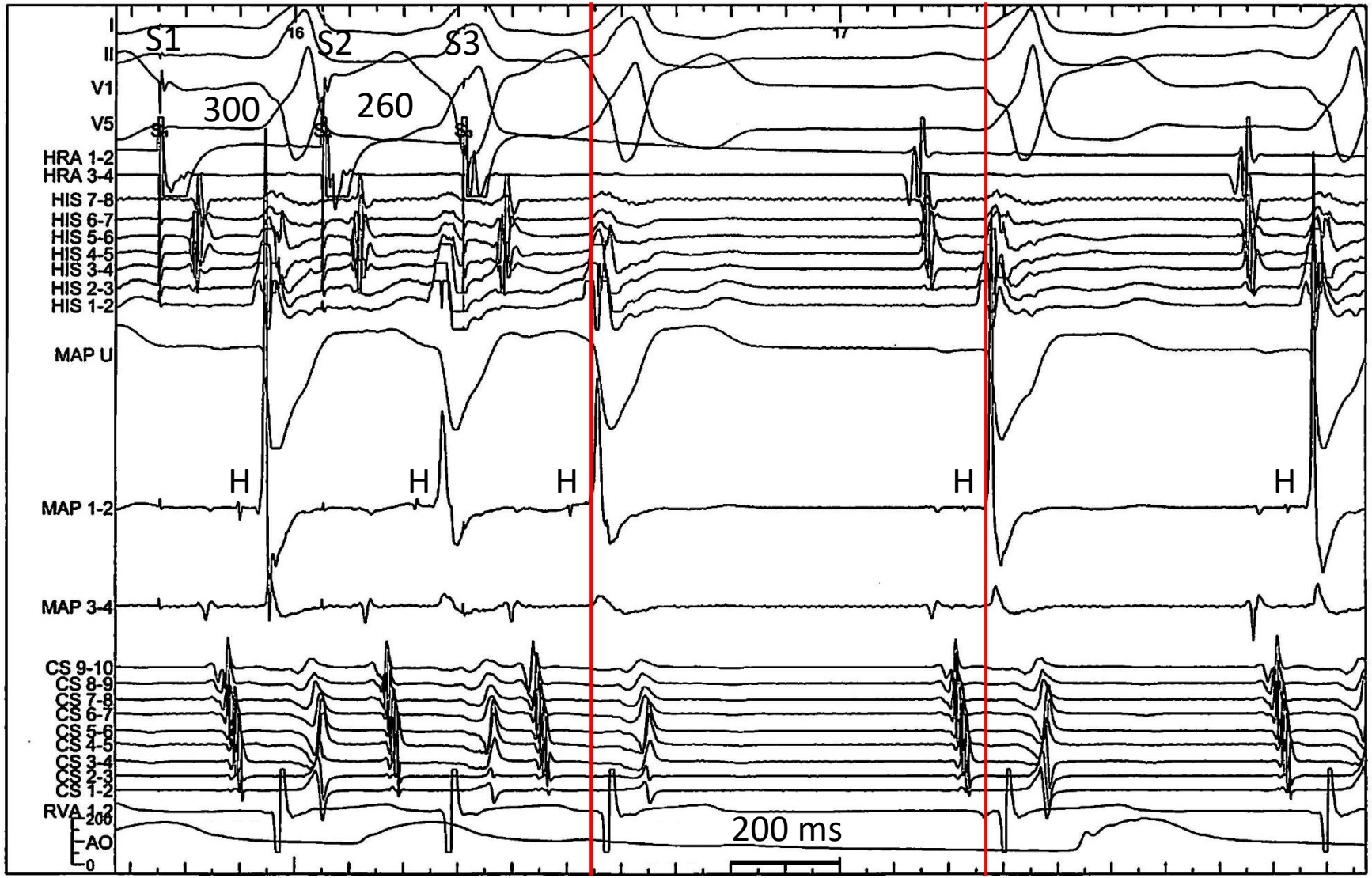


洞調律時にHis束部右室中隔が早期興奮している。逆伝導の心房最早期興奮もHis束記録部位。

Para Hisian Pacing



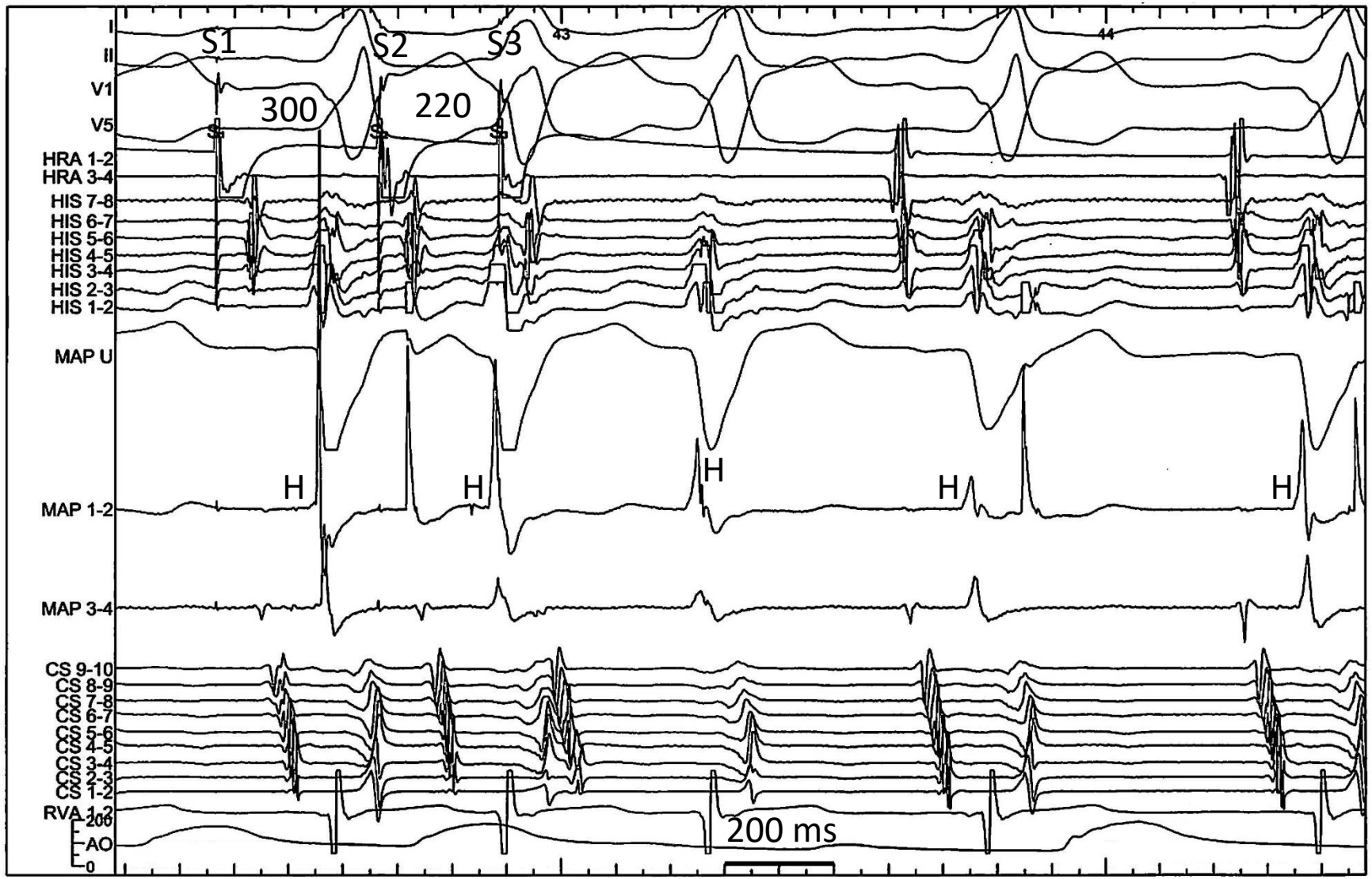
PAS



HBE

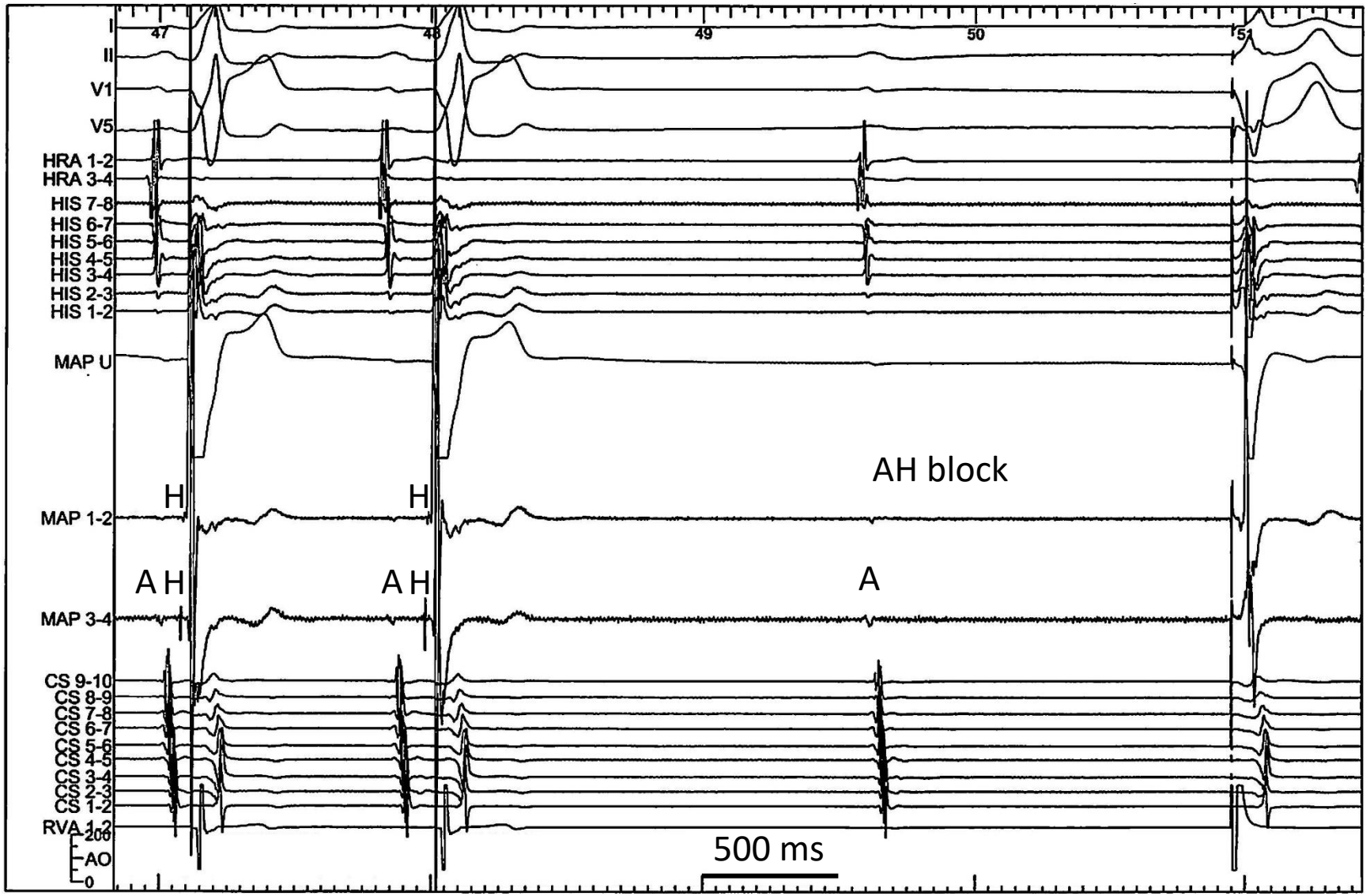
心房早期刺激でA-H間隔は延長する。デルタ波を伴うQRS波形には変化なし。FV?

PAS



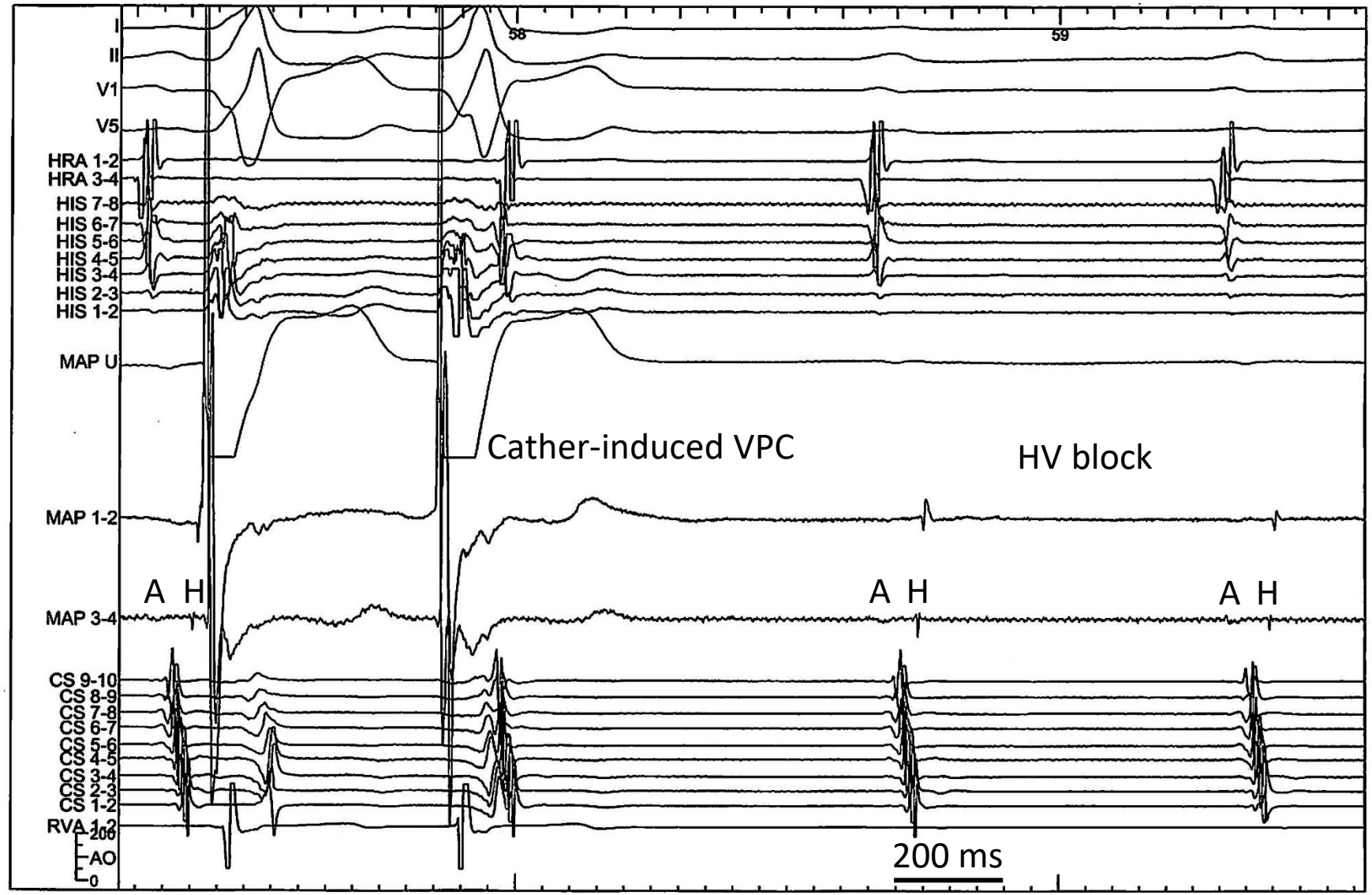
さらに心房早期刺激S2-S3を短縮させると，A-Hはjump-upし，H電位はQRS後方に出現した。FVは否定的。
NV/NFだとすると，QRS波形には変化ないのはなぜ?

Bump



His束電位記録部位をマッピングしていると, AHブロックによる一過性完全房室ブロックが生じた。

Bump



心室早期興奮部位をマッピングしていると, HVブロックによる一過性完全房室ブロックが生じた。

Q6-1：この副伝導路は何?

1. 房室副伝導路
2. NV pathway
3. NF pathway
4. FV pathway
5. わかりません

- 早期興奮は順伝も逆伝も右側中隔
- PASでAH延長するがデルタ波不変
- PASを縮めるとAHはjump-upし心室波の後方に出現しデルタ波は不変
- AVN bumpで完全AHブロック
- 心室最早期興奮部位bumpで完全HVブロック

Q6-1：この副伝導路は何?

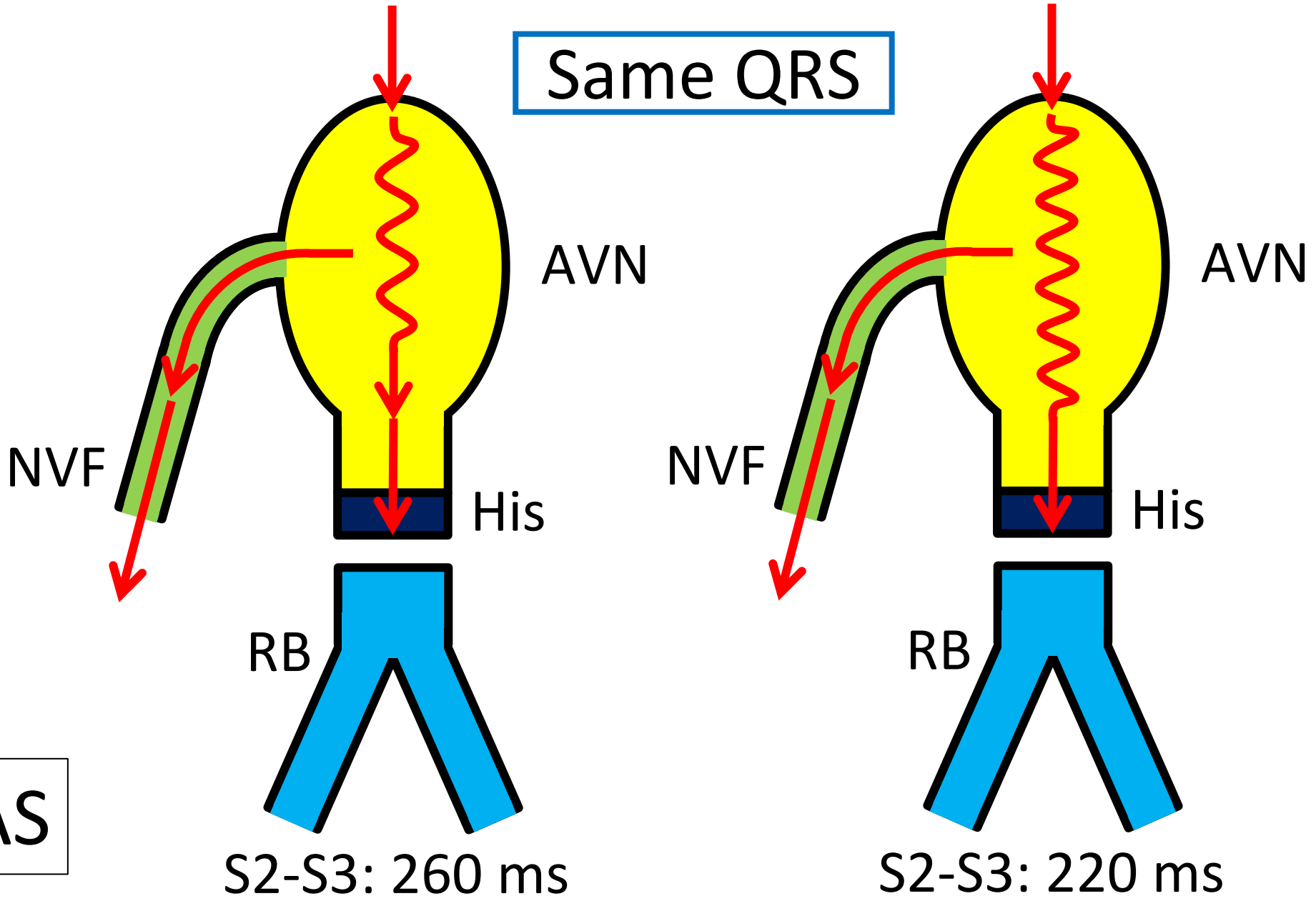
1. 房室副伝導路
2. NV pathway
3. NF pathway
4. FV pathway
5. わかりません

- 早期興奮は順伝も逆伝も右側中隔
- PASでAH延長するがデルタ波不変
- PASを縮めるとAHはjump-upし心室波の後方に出現しデルタ波は不変
- AVN bumpで完全AHブロック
- 心室最早期興奮部位bumpで完全HVブロック

但し，もともとHVブロックが存在している。

NV Fiber and HV Block

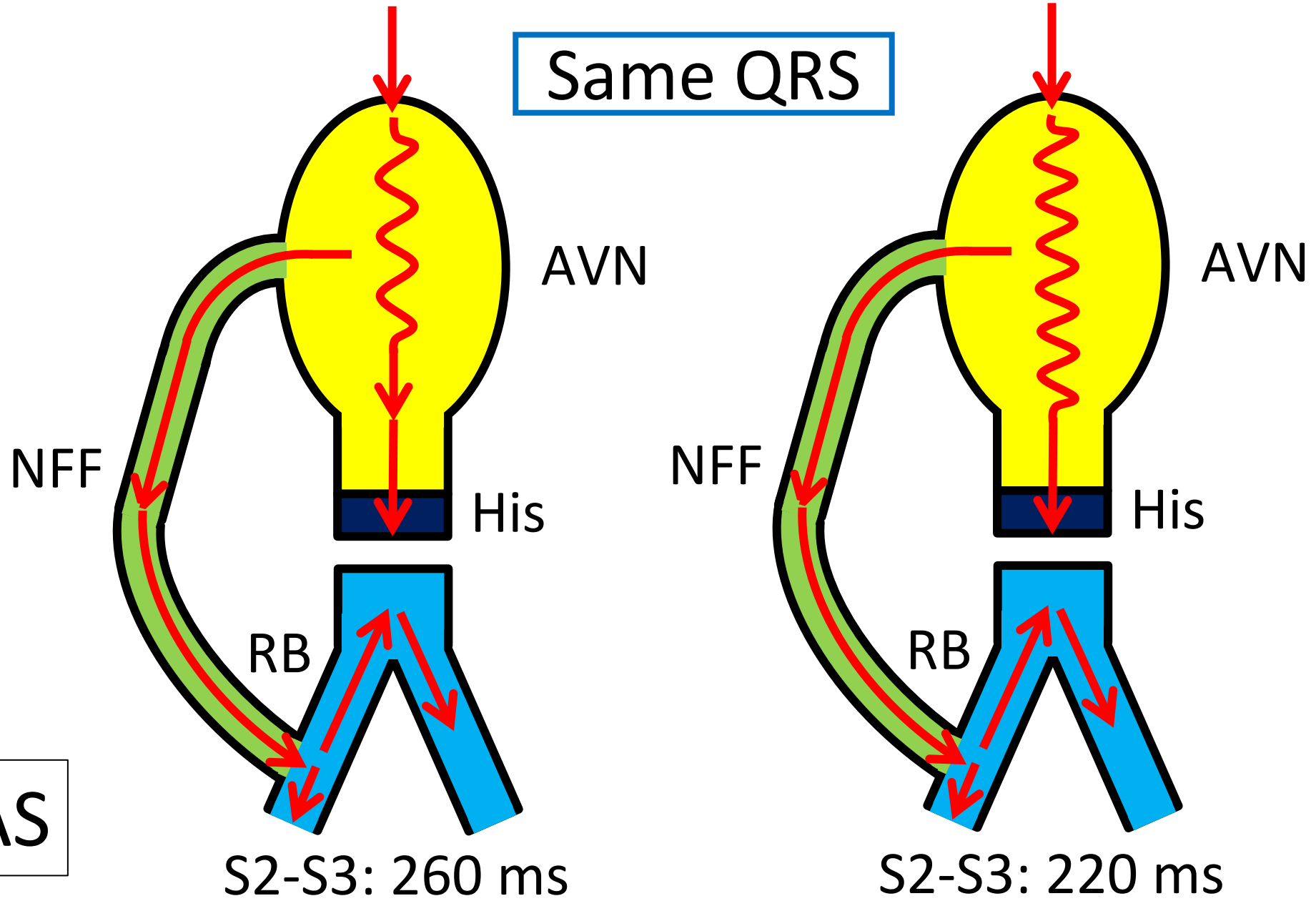
Same QRS



PAS

NF Fiber and HV Block

Same QRS



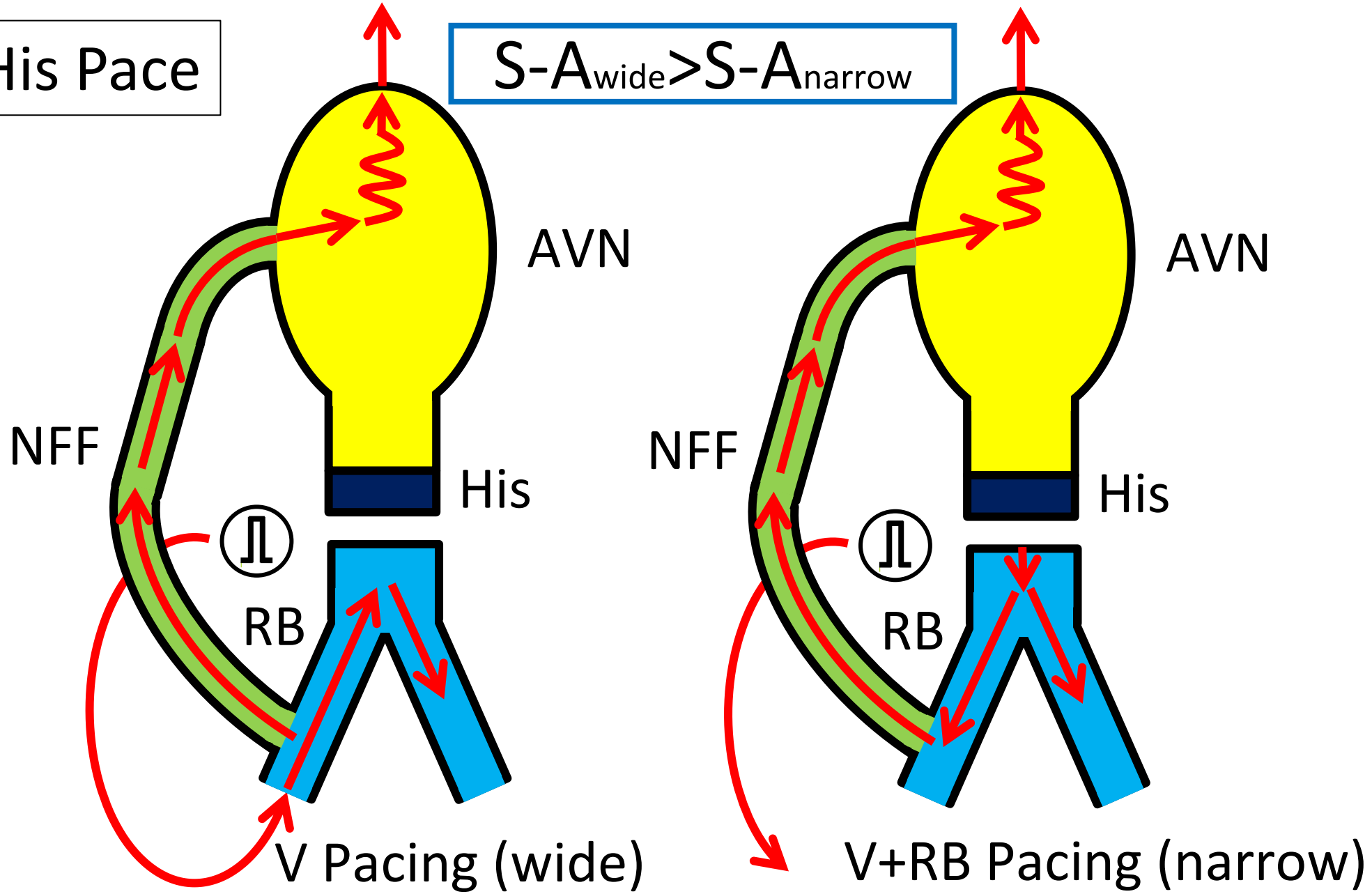
PAS

Para Hisian Pacing

NF Fiber and HV Block

Para-His Pace

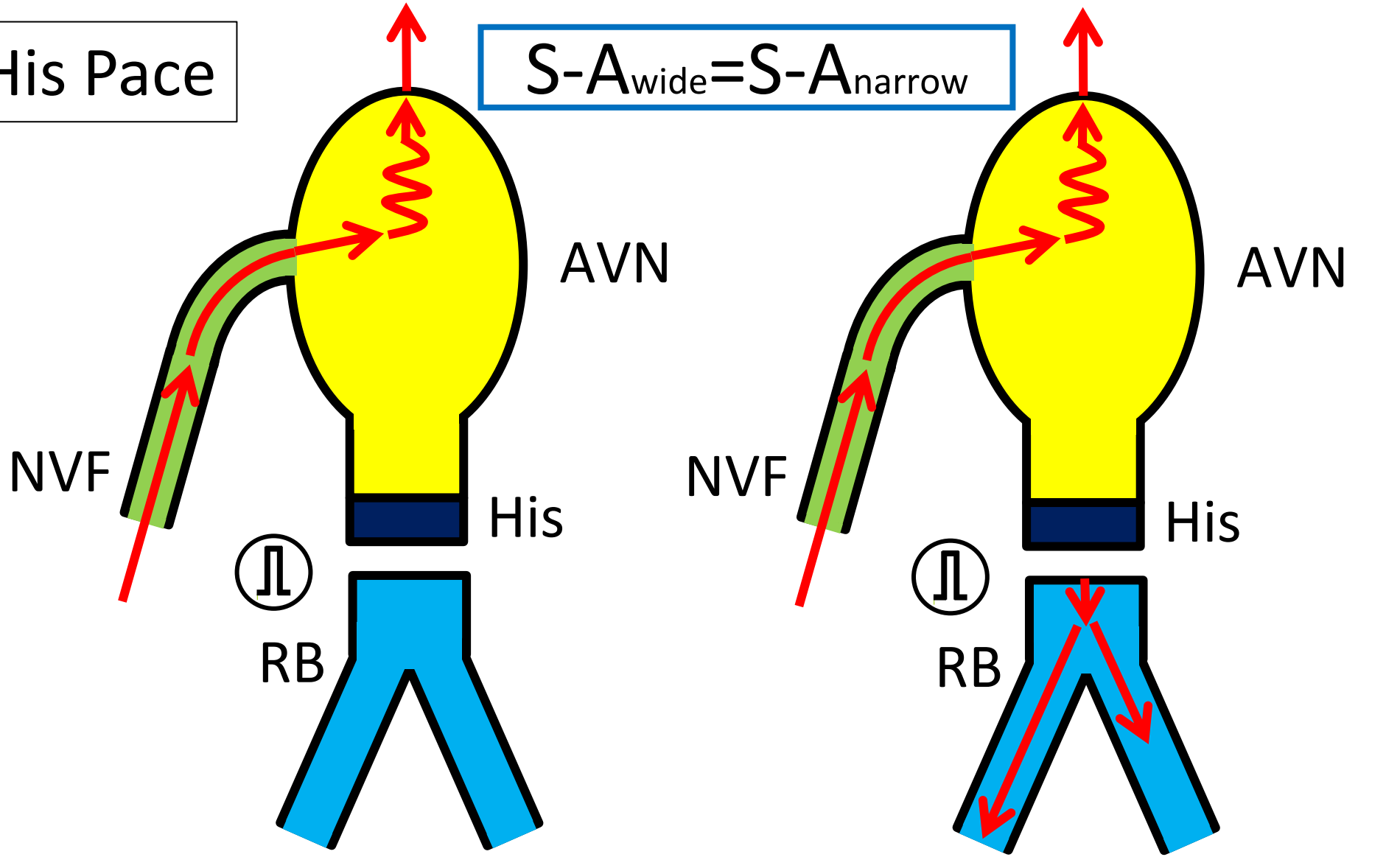
$S\text{-}A_{wide} > S\text{-}A_{narrow}$



NV Fiber and HV Block

Para-His Pace

$S\text{-}A_{wide} = S\text{-}A_{narrow}$



V Pacing (wide)

V+RB Pacing (narrow)

Q6-1：この副伝導路は何?

1. 房室副伝導路
2. NV pathway
3. NF pathway
4. AF pathway
5. FV pathway
6. わかりません

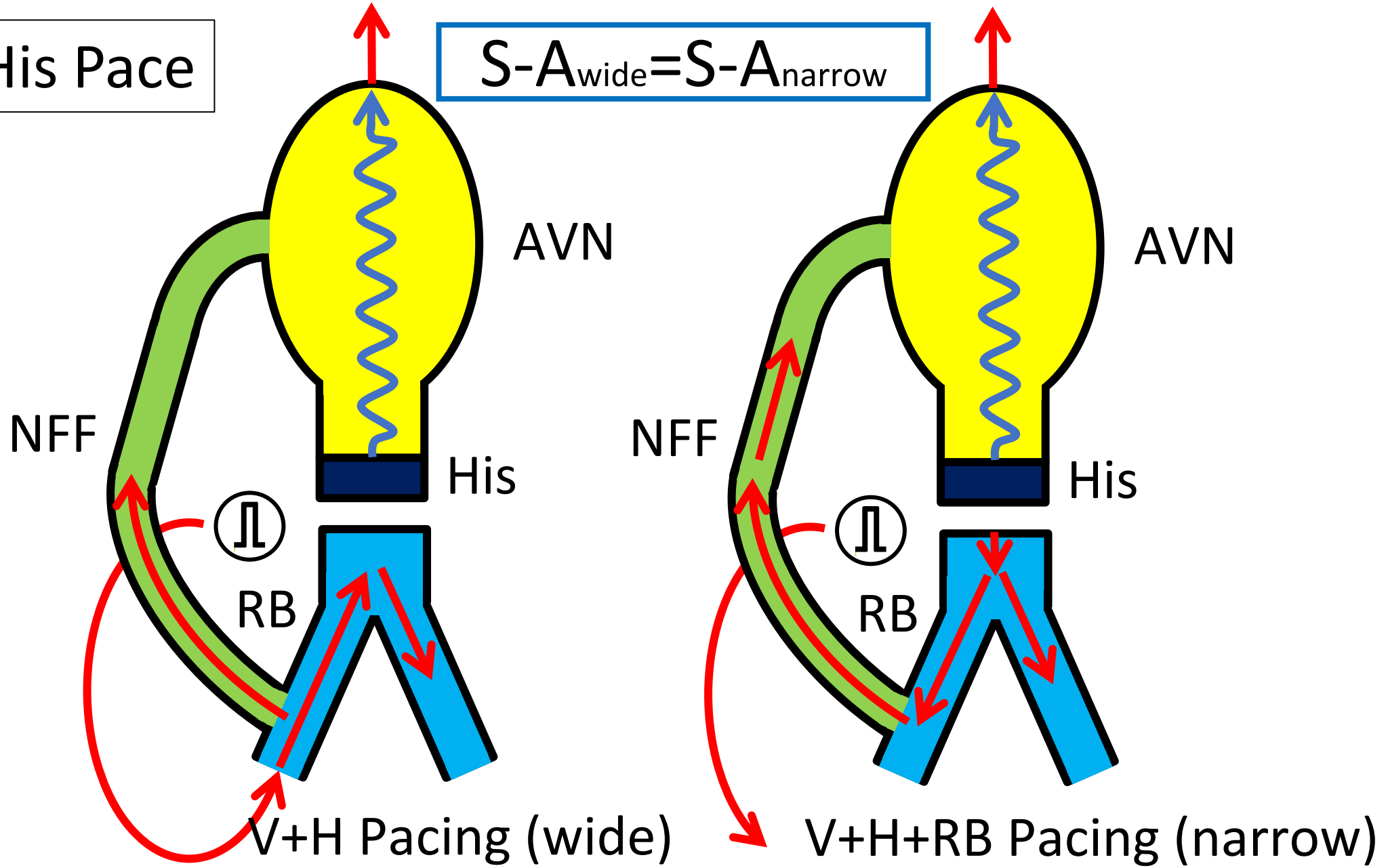
但し，もともとHVブロックが存在している。

NF Fiber and HV Block

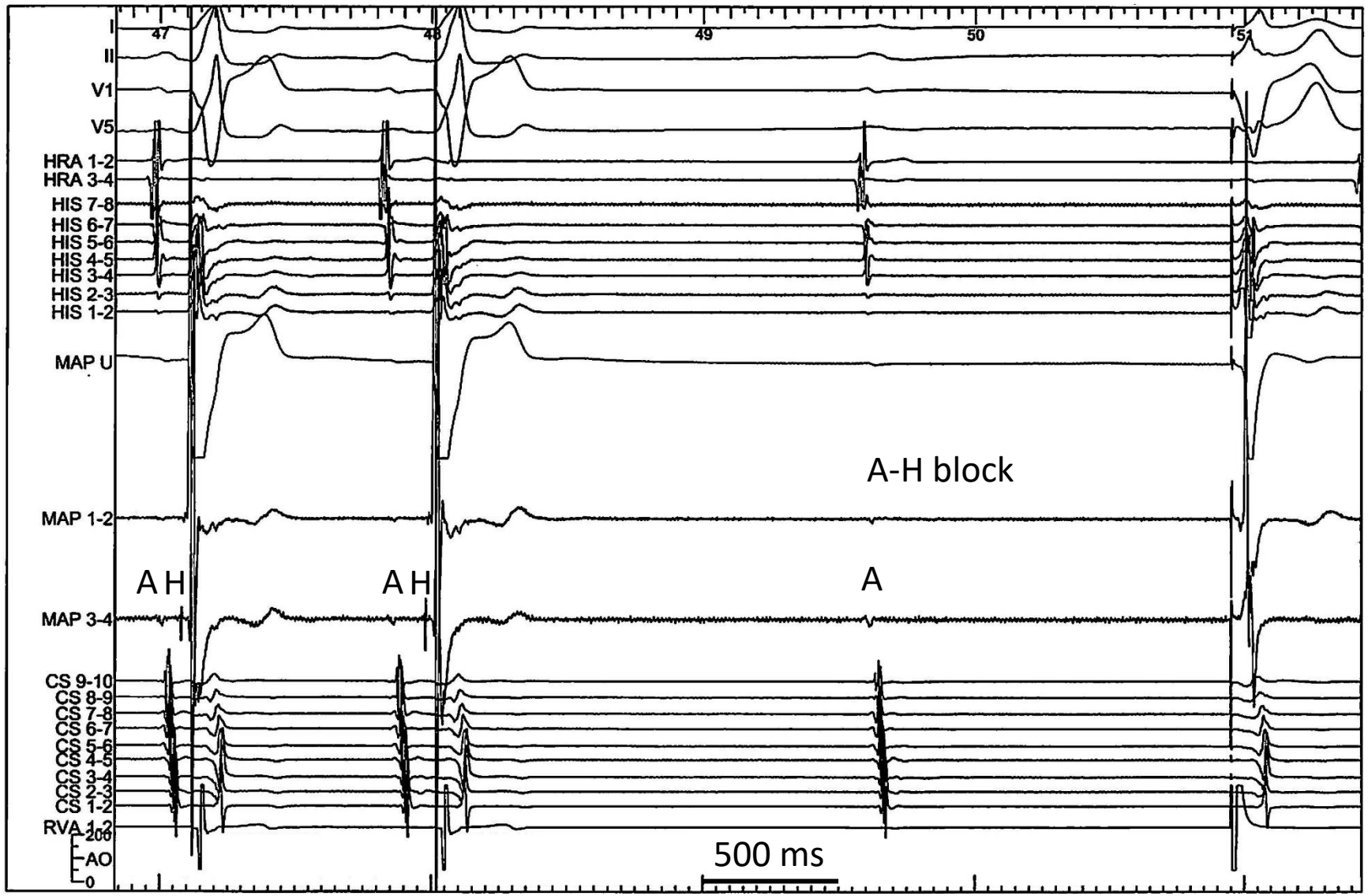
Para-His Pace

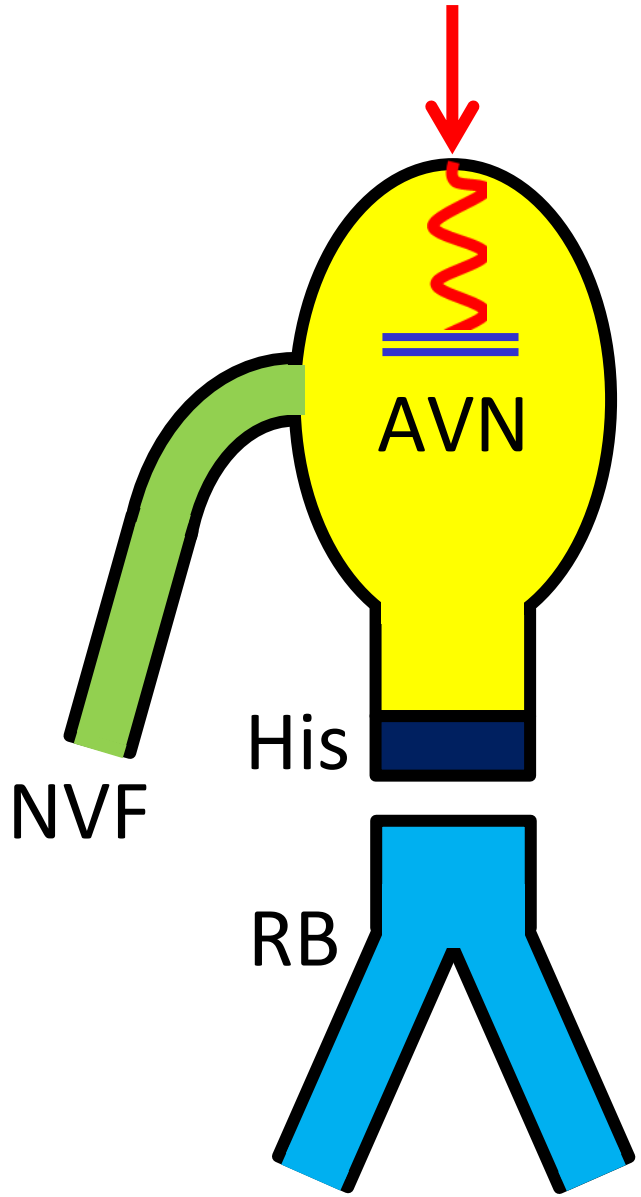
$S\text{-}A_{wide}=S\text{-}A_{narrow}$

?

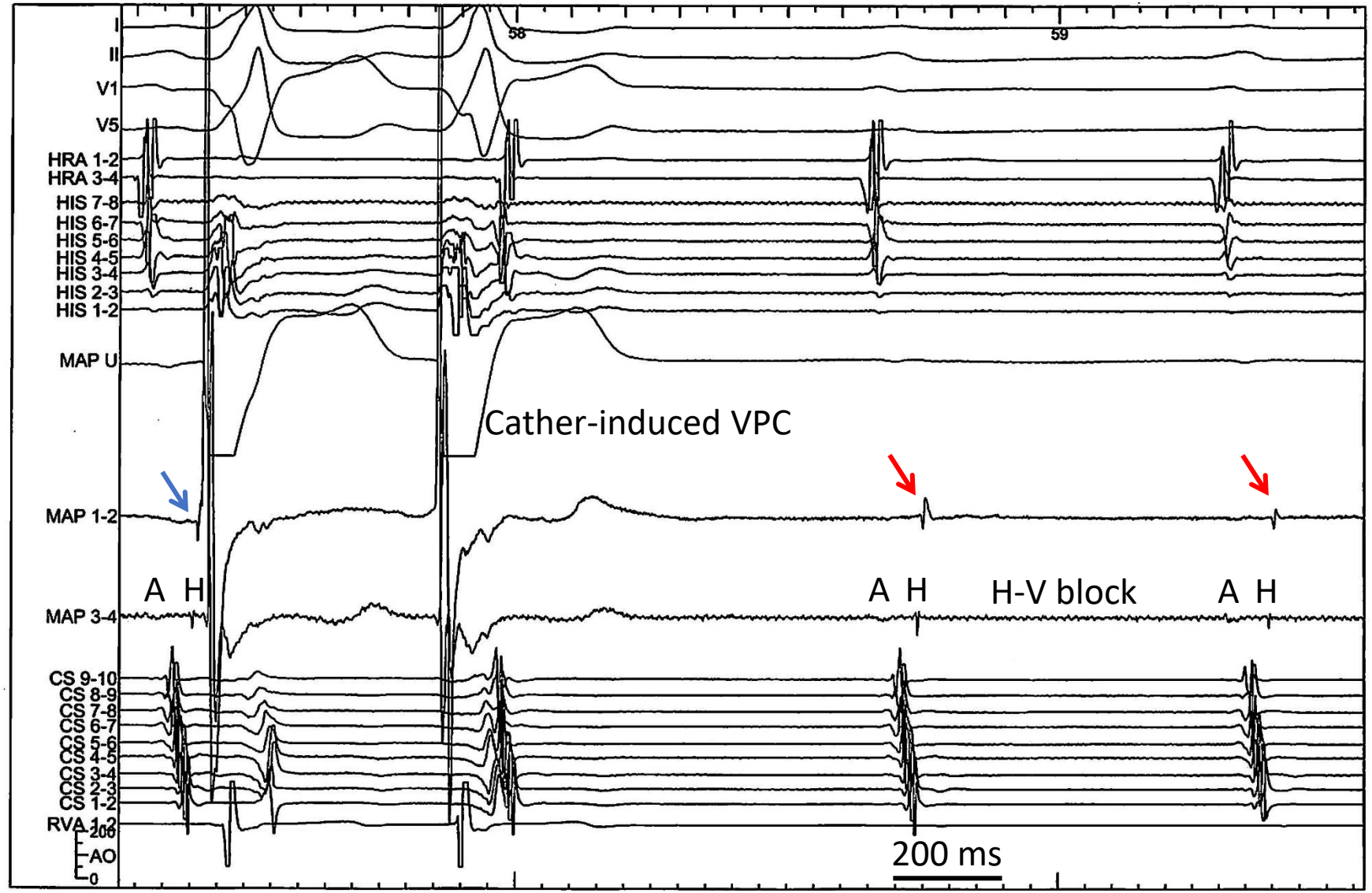


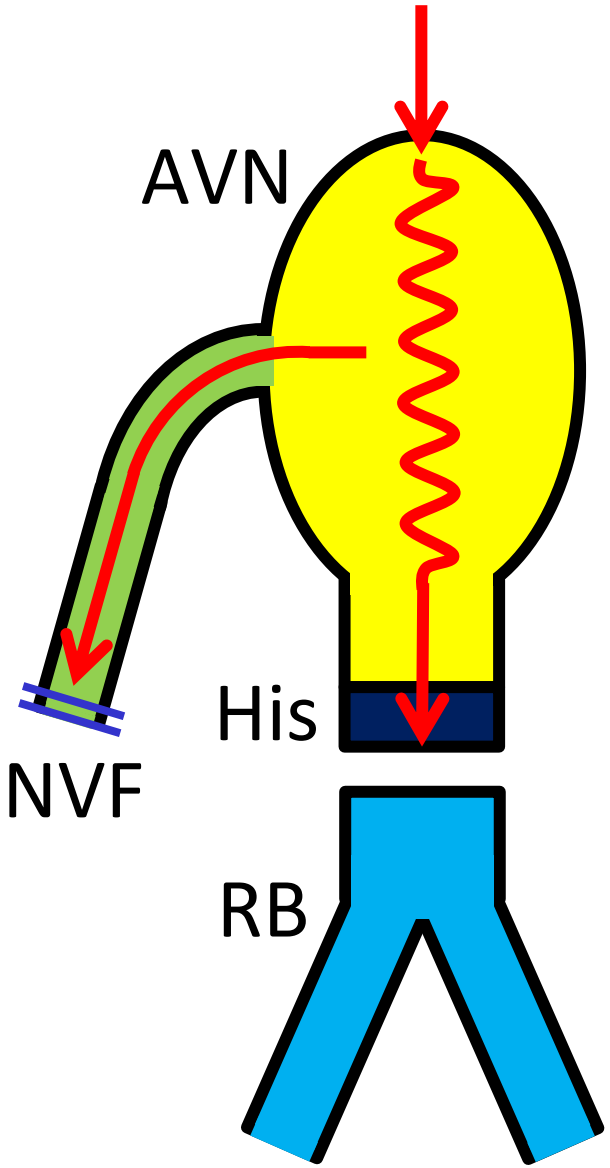
Transient AVN (Upper Portion) Block





Transient NV pathway Block



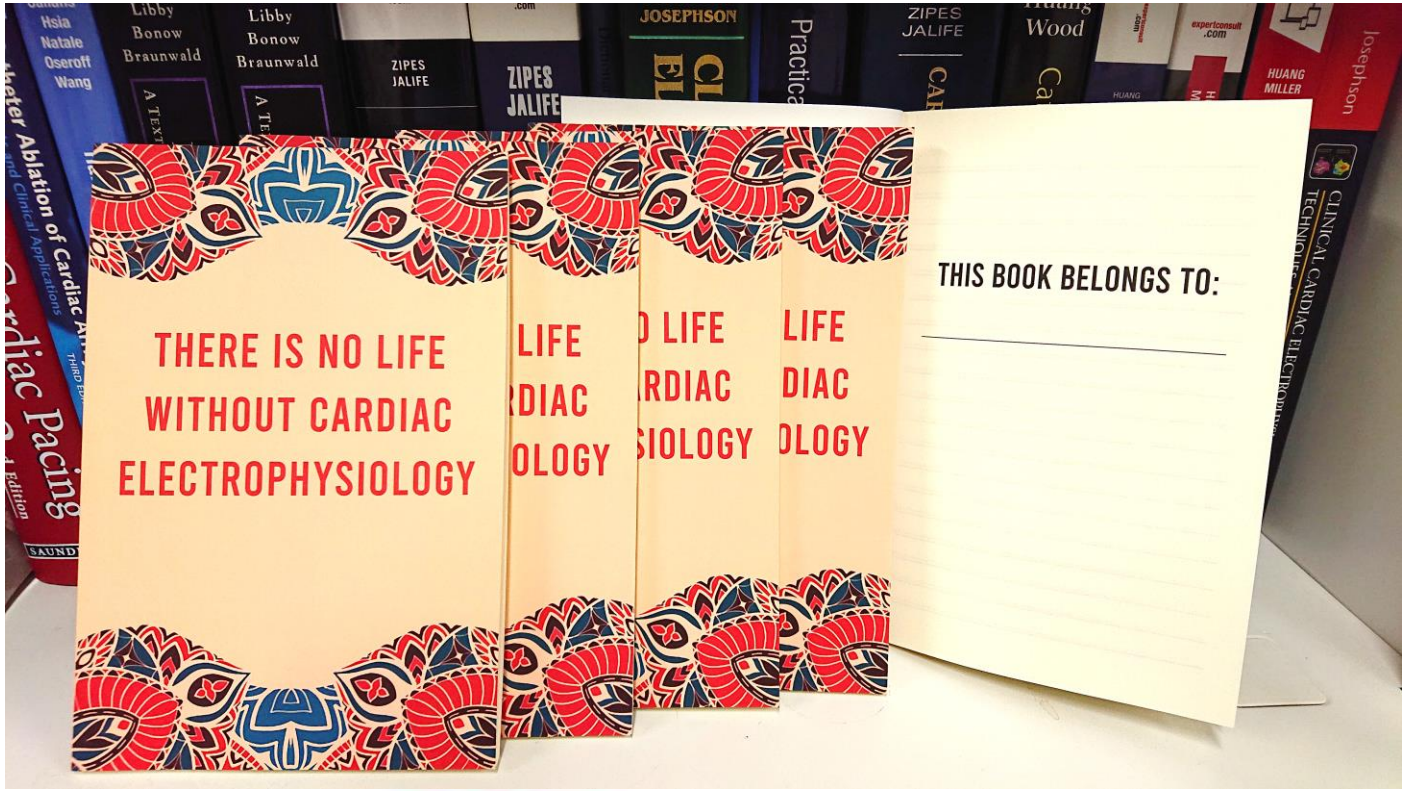


76歳男性, 失神

アブレーションせず
PMI施行
以後失神消失

診断
完全HVブロックと
nodo-ventricular副伝導路

Thank You


THERE IS NO LIFE
WITHOUT CARDIAC
ELECTROPHYSIOLOGY
THIS BOOK BELONGS TO: