12. Atriyal Fibrilasyon Zirvesi 2023
8-9 Aralık 2023
Nirvana Cosmopolitan Kongre Merkezi, Antalya

# *Tipik atriyal flatter*

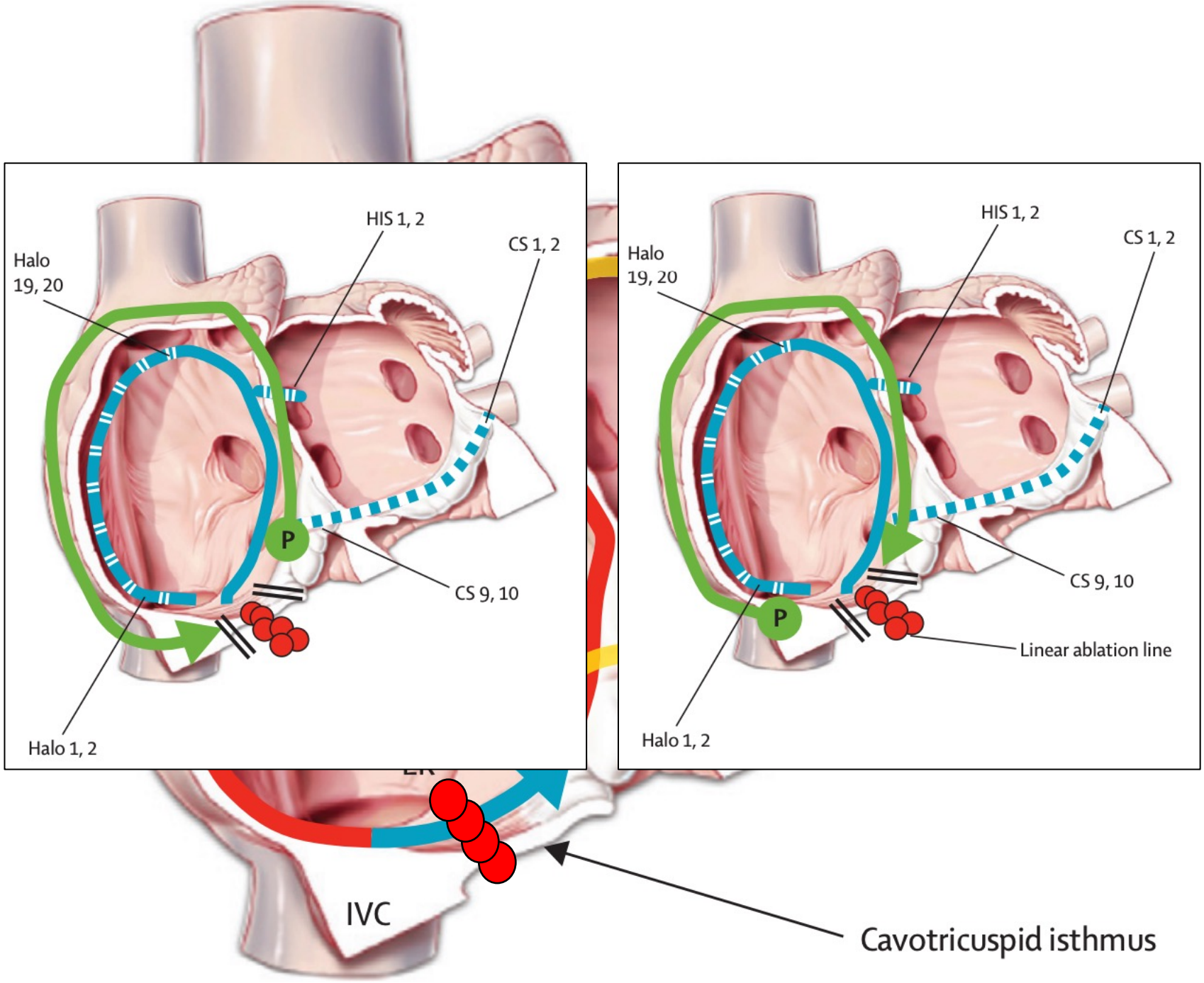
## Ablasyon sonucunun değerlendirilmesi

Dr. V. Kutay VURGUN

Yüksek İhtisas Üniversitesi Tıp Fakültesi, Kardiyoloji ABD
Ankara Liv Hospital

09.12.2023

- Çıkar çatışmam yoktur.


HIS 1, 2
CS 1, 2
Halo
19, 20
P
CS 9, 10
Halo 1, 2
HIS 1, 2
CS 1, 2
Halo
19, 20
CS 9, 10
P
Linear ablation line
Halo 1, 2
IVC
Cavotricuspid isthmus

# Bi-Directional Komplet Blok

- Ablasyon sırasında taşikardinin sonlanması
- Ablasyon sonrası Tipik AFL indüklenmemesi
- CS/LLRA pacing ile HALO da tek yünlü ileti

Bi-directional komplet bloğun gösterilmesi GEREKİYOR

# Local Electrogram-Based Criteria of Cavotricuspid Isthmus Block

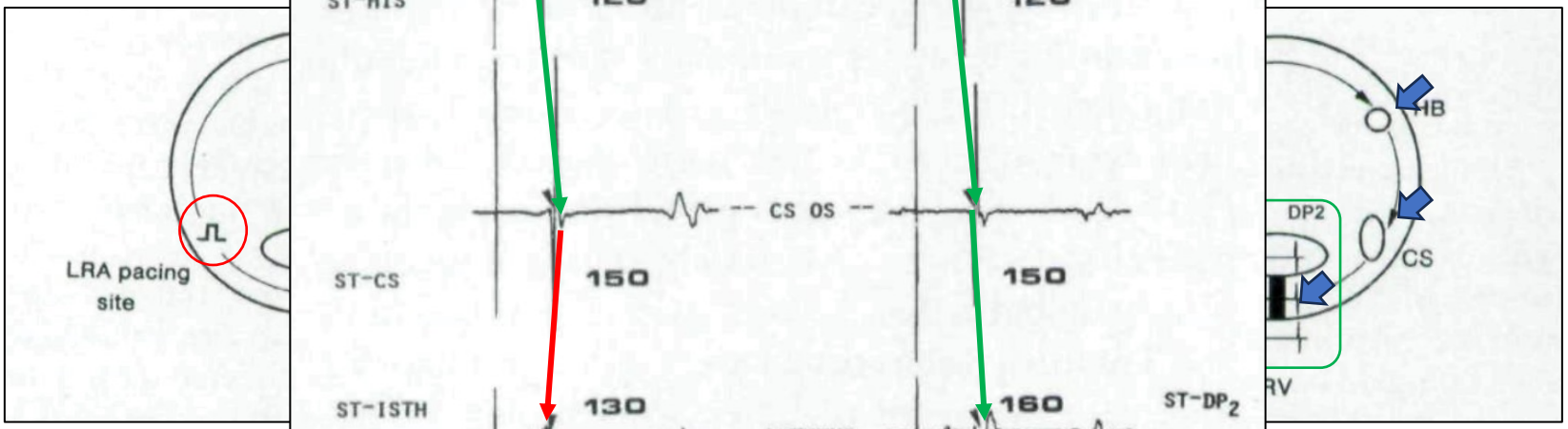
DIPEN C. SHAH, M.D., ATSUSHI TAKAHASHI, M.D., PIERRE JAÏS, M.D., MÉLÈZE HOCINI, M.D., JACQUES CLÉMENTY, M.D., AND MICHEL HAÏSSAGUERRE, M.D.

From the CHU de Bordeaux, Hôpital Cardiologique du Haut-Lévêque Pessac, France

**Double Potential Criteria of Isthmus Block.** *Introduction:* **The efficacy and outcome of cavotricuspid isthmus ablation guided by local electrogram-based criteria of linear block were prospectively assessed.**

*Methods and Results:* **In 40-consecutive patients (age 65 ±11 years) with typical right atrial (RA) flutter (cycle length = 255 ± 31msec), radiofrequency (RF) energy was delivered at electrograms in the isthmus coinciding with the center of the ECG plateau until termination of flutter, followed by local assessment of isthmus conduction during slow rate low-lateral RA pacing. 'Gaps' in the ablation line were located in the form of single or fractionated potentials centered on the isoelectric intervals of adjacent double potentials and ablated. Complete linear isthmus block was defined by the achievement of a complete corridor of parallel double potentials from the right ventricle to the inferior vena cava edge. Applications of 11 ± 7 RF applications were required in all patients to achieve a complete line of double potentials separated by an isoelectric interval of 120 ± 26 msec (range 60 to 190). After 6 ± 3 RF applications, 6 (15%) patients had evidence of isthmus block using indirect RA activation sequence mapping without a complete line of double potentials. 5 ± 5 further RF applications of eliminated local conduction and achieved complete linear block without altering descending septal RA activation. Conduction recovery occurred in 20 (50%) patients—1.85 times per patient—indicated by reversed changes in local electrograms eliminated by further ablation of the recovered gaps. After discharge, two recurrences (5%) occurred during a follow-up of 16 ± 2 months.**

*Conclusion:* **Double potential mapping is an effective assessment modality for local isthmus conduction. Slow conduction limited to the ablation line is observed during ablation in 15% of patients.** *(J Cardiovasc Electrophysiol, Vol. 10, pp. 662-669, May 1999)*


LRA pacing site
I
II
III
VI
HBE
ST-HIS
120
120
CS OS
ST-CS
150
150
ST-ISTH
130
ISTHMUS
160
ST-DP2
HB
CS
LRA pacing site
RV
Ablation line with gap
HB
CS
RV
HB
DP2
CS
RV

# Differential Pacing for Distinguishing Block From Persistent Conduction Through an Ablation Line

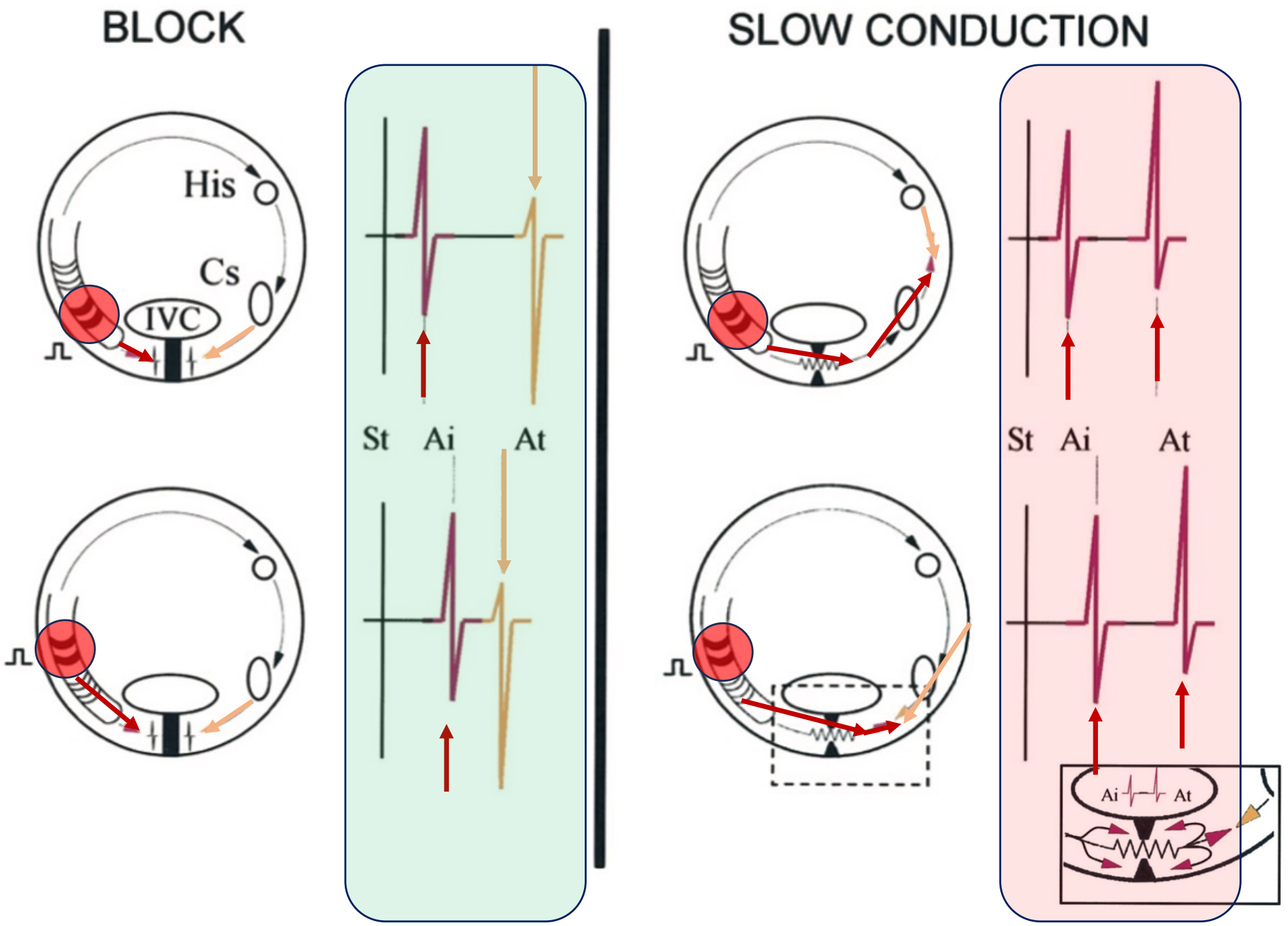
Dipen Shah, MD; Michel Haïssaguerre, MD; Atsushi Takahashi, MD; Pierre Jaïs, MD; Mélèze Hocini, MD; Jacques Clémenty, MD

***Background***—Because complete linear conduction block is necessary to minimize the recurrence of reentrant tachycardias such as typical atrial flutter, we investigated a simple technique to recognize a persistent gap or complete linear block.

***Methods and Results***—We prospectively evaluated cavotricuspid isthmus conduction in 50 patients (age 63±8 years, 43 men) after radiofrequency ablation. The distal and proximal bipoles of a quadripolar catheter placed close to the ablation line were successively stimulated during recording from the ablation line. We hypothesized that because the initial and terminal components of local potentials reflected activation at the ipsilateral and contralateral borders of the ablation lesion, a change to a more proximal pacing site without moving the catheter would prolong the stimulus to the initial component timing, whereas the response of the terminal component would depend on the presence of block or persistent conduction. A shortening or no change in timing of the terminal component would indicate block, whereas lengthening would indicate persistent gap conduction. The results were compared with previously described criteria for isthmus block. Ninety-two sites were assessed: 17 before and 75 after the achievement of complete isthmus block. The timing of the initial component was delayed by 19±9 ms, and the terminal component was advanced by 13±8 ms after block and delayed by 12±9 ms in case of persisting conduction. The sensitivity, specificity, and positive and negative predictive values for linear block were 100%, 75%, 94%, and 100%, respectively.

***Conclusions***—An accurate assessment of isthmus block or persistent isthmus conduction is possible with this technique of differential pacing. (***Circulation*. 2000;102:1517-1522.**)

**Key Words:** conduction ■ cavotricuspid isthmus ■ pacing maneuver


BLOCK
SLOW CONDUCTION
His
Cs
IVC
St
Ai
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Journal of Interventional Cardiac Electrophysiology 13, 125–134, 2005


# *Differential Pacing for Distinguishing Slow Conduction from Complete Conduction Block of the Tricuspid-Inferior Vena Cava Isthmus after Radiofrequency Ablation for Atrial Flutter—Role of Transverse Conduction through the Crista Terminalis*

*Hidezou Sugimura, Ichiro Watanabe, Yasuo Okumura, Kimie Ohkubo, Sonoko Ashino, Toshiko Nakai, Yuji Kasamaki, and Satoshi Saito*

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***Abstract.*** ***Background:*** **Partial conduction block has been suggested a predictor of recurrence of atrial flutter (AFL).**

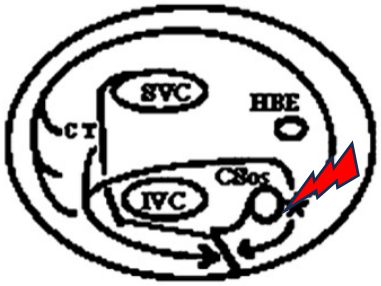
***Aim:*** **The aim of this study was to assess transverse conduction by the crista terminalis (CT) as a problem in evaluating isthmus block and the usefulness of differential pacing for distinguishing slow conduction (SC) and complete conduction block (CB) across the ablation line.**

***Methods:*** **We assessed 14 patients who underwent radiofrequency catheter ablation of the eustachian valve/ridge–tricuspid valve isthmus for typical AFL. Activation patterns along the tricuspid annulus (TA) suggested incomplete CB across the isthmus. In these patients, atrial pacing was performed from the low posteroseptal (PS) and anteroseptal (AS) right atrium (RA) while the ablation catheter was placed at the ablation line where double potentials (DPs) could be recorded. The pattern of activation of the RA free wall was assessed by a 20-pole catheter positioned along the CT during pacing from the coronary sinus (CS) ostium (CSos) and low lateral RA (LLRA).**

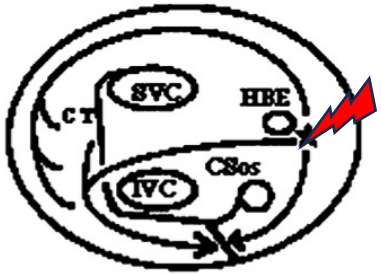
***Results:*** **Faster transverse conduction across the CT resulted in simultaneous or earlier activation of the distal halo electrodes than of the more proximal electrodes, suggesting incomplete conduction block across the isthmus. CB (13) and SC (1) were detected as changes in the activation times of the first and second components of DPs (DP1, DP2) during PS RA pacing and AS RA. Similar changes in the activation times DP1 and DP2 during AS RA pacing as compared to PS RA reflected SC through the isthmus, whereas increased DP1 activation time and decreased of DP2 activation time reflected complete conduction block across the isthmus.**

***Conclusions:*** **Transverse conduction across the CT influences the sequence of activation along the TA after isthmus ablation. Differential pacing can distinguish SC from complete conduction block across the ablation line in the isthmus.**

CSos pacing

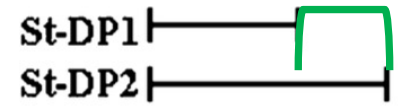



Near His pacing

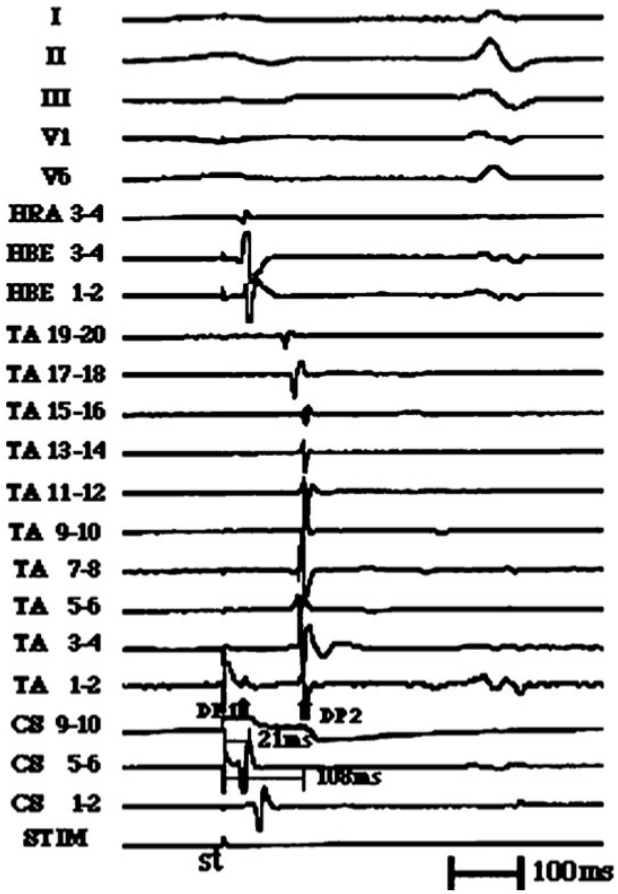



CSos pacing


Near His pacing




CSos pacing

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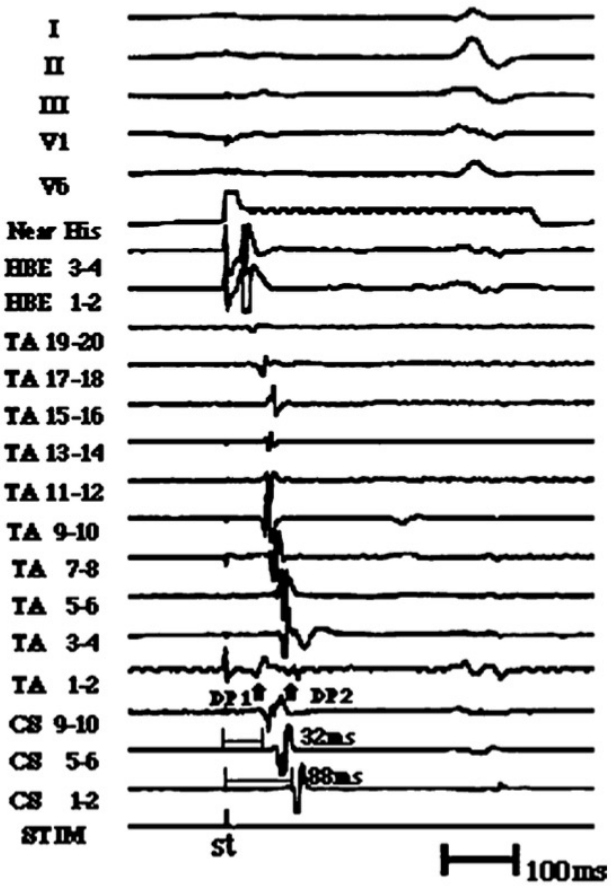
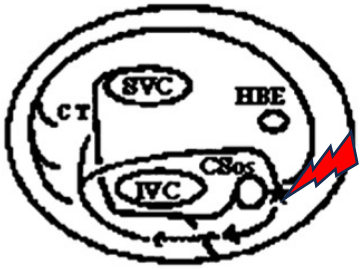
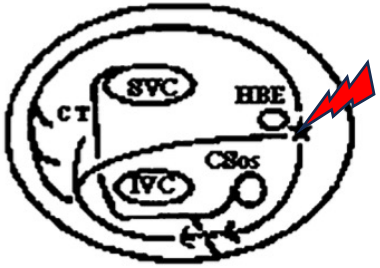



COMPLET BLOCK

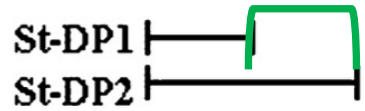
CSos pacing



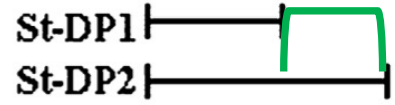

Near His pacing



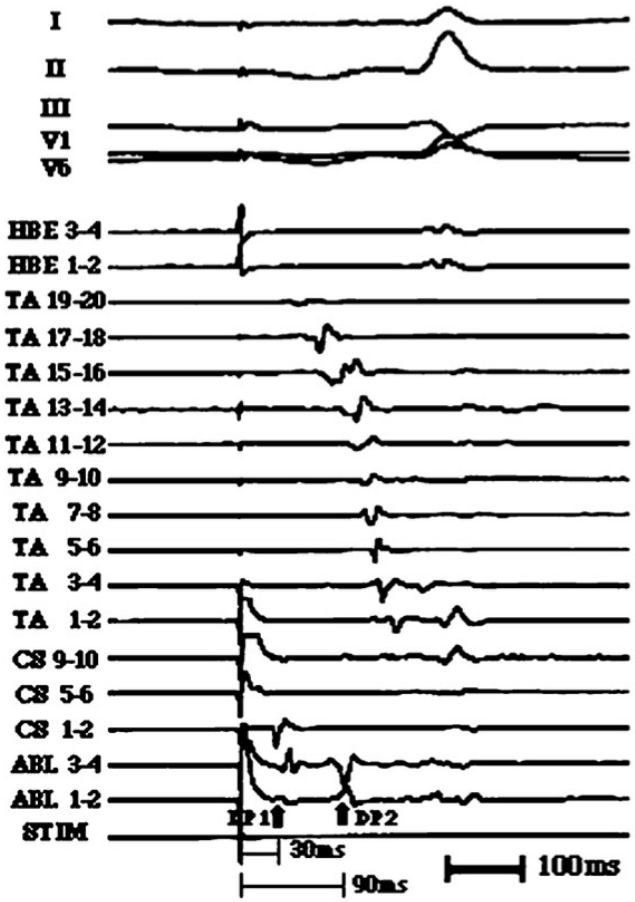

CSos pacing



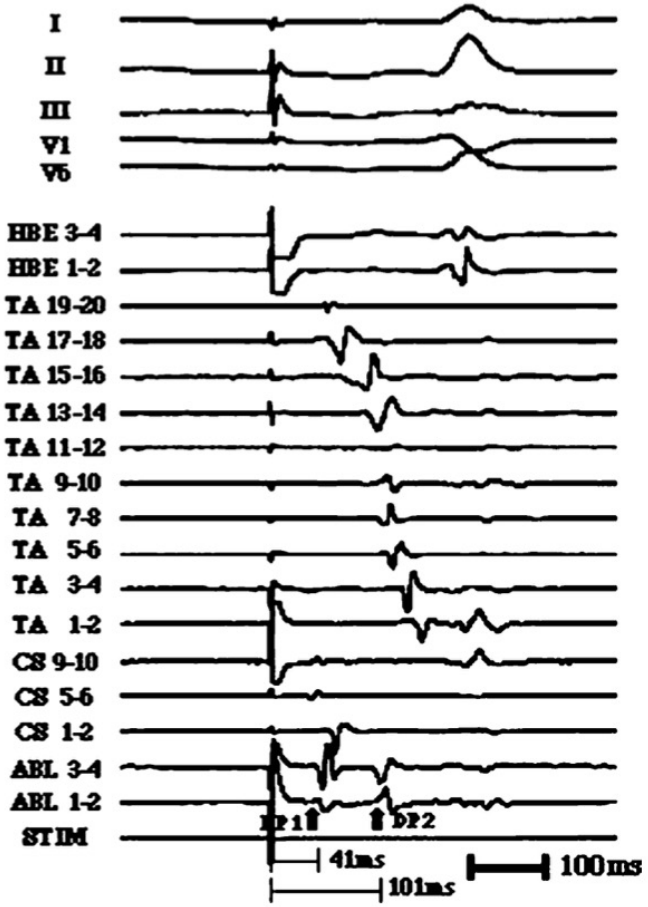

Near His pacing




CSos pacing




Near His pacing




INCOMPLET BLOCK- persistent conduction

# Double Potentials Along the Ablation Line as a Guide to Radiofrequency Ablation of Typical Atrial Flutter

Hiroshi Tada, MD, Hakan Oral, MD, Christian Sticherling, MD, Steven P. Chough, MD, Robert L. Baker, MD, Kristina Wasmer, MD, Frank Pelosi, JR, MD, Bradley P. Knight, MD, FACC, S. Adam Strickberger, MD, FACC, Fred Morady, MD, FACC

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**OBJECTIVES** The purpose of this study was to determine the characteristics of double potentials (DPs) that are helpful in guiding ablation within the cavo-tricuspid isthmus.

**BACKGROUND** Double potentials have been considered a reliable criterion of cavo-tricuspid isthmus block in patients undergoing radiofrequency ablation of typical atrial flutter (AFL). However, the minimal degree of separation of the two components of DPs needed to indicate complete block has not been well defined.

**METHODS** Radiofrequency ablation was performed in 30 patients with isthmus-dependent AFL. Bipolar electrograms were recorded along the ablation line during proximal coronary sinus pacing at sites at which radiofrequency ablation resulted in incomplete or complete isthmus block.

**RESULTS** Double potentials were observed at 42% of recording sites when there was incomplete isthmus block, compared with 100% of recording sites when the block was complete. The mean intervals separating the two components of DPs were 65 ± 21 ms and 135 ± 30 ms during incomplete and complete block, respectively ($p < 0.001$). An interval separating the two components of DPs ($DP_{1-2}$ interval) <90 ms was always associated with a local gap, whereas a $DP_{1-2}$ interval ≥110 ms was always associated with local block. When the $DP_{1-2}$ interval was between 90 and 110 ms, an isoelectric segment within the DP and a negative polarity in the second component of the DP were helpful in indicating local isthmus block. A $DP_{1-2}$ interval ≥90 ms with a maximal variation of 15 ms along the entire ablation line was an indicator of complete block in the cavo-tricuspid isthmus.

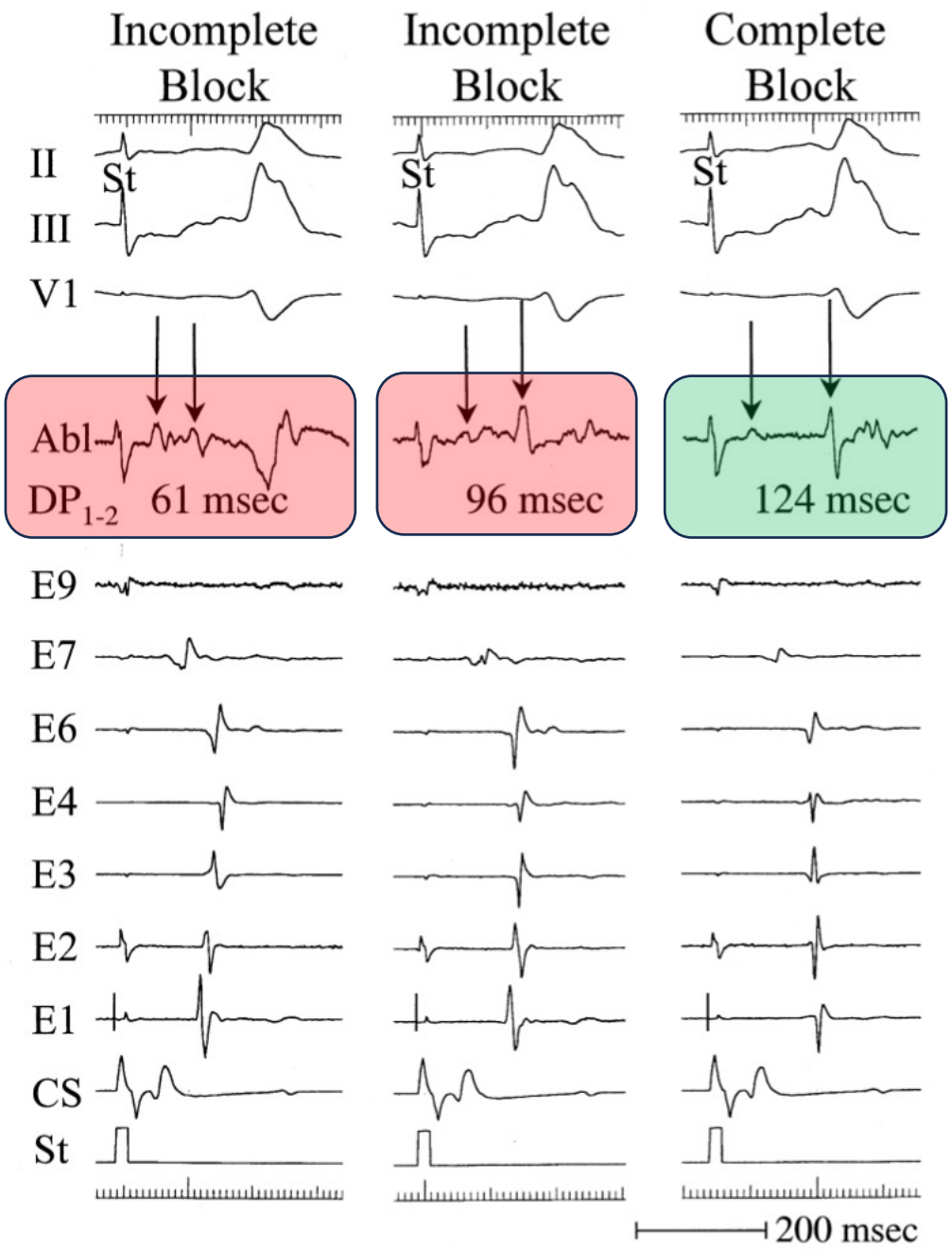
**CONCLUSIONS** Detailed analysis of DPs is helpful in identifying gaps in the ablation line and in distinguishing complete from incomplete isthmus block in patients undergoing radiofrequency ablation of typical AFL. (J Am Coll Cardiol 2001;38:750–5) 

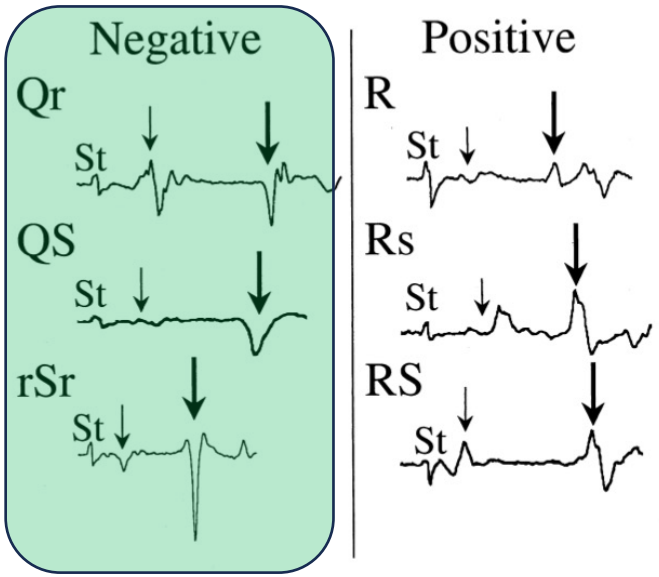
**Table 1.** Sensitivity, Specificity and Predictive Accuracy for Complete Isthmus Block

| Criteria* | Sensitivity (%) | Specificity (%) | PPV (%) | NPV (%) |
|---|---|---|---|---|
| $DP_{1-2}$ ≥90 ms | 100 | 80 | 86 | 100 |
| $DP_{1-2}$ ≥110 ms | 83 | 100 | 100 | 83 |
| $DP_{1-2}$ ≥90 ms + isoelectric interval | 83 | 96 | 96 | 83 |
| $DP_{1-2}$ ≥90 ms + negative $DP_2$ | 90 | 88 | 90 | 88 |
| $DP_{1-2}$ ≥90 ms + isoelectric interval + negative $DP_2$ | 77 | 100 | 100 | 78 |

*There were no significant differences among these criteria.

$DP_{1-2}$ = interval separating the two components of double potentials; $DP_2$ = second component of a double potential; NPV = negative predictive accuracy; PPV = positive predictive accuracy.




J Am Coll Cardiol 2001;38:750–5

# Incremental Pacing for the Diagnosis of Complete Cavotricuspid Isthmus Block During Radiofrequency Ablation of Atrial Flutter

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**Incremental Pacing for the Diagnosis of Cavotricuspid Isthmus Block.** ***Background:*** **Complete conduction block of the cavotricuspid isthmus (CTI) reduces atrial flutter recurrences after ablation. Incremental rapid pacing may distinguish slow conduction from complete CTI conduction block.**

***Methods and Results:*** **Fifty-two patients (67 ± 9 years) undergoing 55 CTI ablation procedures were included. With ablation, double potentials (DPs) separated by an isoelectric line of ≥30 ms were obtained. Incremental atrial pacing (600–250 ms) was performed from coronary sinus (CS) and low lateral right atrium (LLRA). A <20 ms increase in the DPs distance during incremental pacing was indexed as complete CTI block. In 8 patients, an initial <20 ms DPs distance increase was noted; direct complete isthmus block was suggested and no additional ablation performed. In the remaining, the CTI line was remapped for conduction gaps and additional radiofrequency energy pulses applied. Complete block, as indexed by incremental pacing, occurred in 46 of 55 procedures, with one flutter recurrence (follow-up 8 ± 2 months): DPs interval variation of 116 ± 20 to 123 ± 20 ms (CS), P = 0.21; and 122 ± 25 to 135 ± 35 ms (LLRA), P = 0.17. The remaining 9 patients (persistent rate-dependent DPs increase) presented 3 flutter recurrences, P = 0.01: DP distance from 127 ± 15 to 161 ± 18 ms (CS), P < 0.001; and 114 ± 24 to 142 ± 10 ms (LLRA), P = 0.007.**

***Conclusion:*** **Incremental pacing distinguishes complete CTI block from persistent conduction. Such identification, accompanied by additional ablation to achieve block, should minimize flutter recurrences after ablative therapy.** *(J Cardiovasc Electrophysiol, Vol. 21, pp. 33-39, January 2010)*

**TABLE 1**

Incremental Pacing During Persistent CTI Conduction and/or CTI Functional Block (Phase 1)

| | DP @ 600 ms | DP @ 500 ms | DP @ 400 ms | DP @ 300 ms | DP @ 250 ms | P |
|---|---|---|---|---|---|---|
| LLRA | 89 ± 34 | 101 ± 34 | 104 ± 32 | 122 ± 33 | 130 ± 34 | < 0.001 |
| CS | 79 ± 24 | 88 ± 24 | 94 ± 23 | 111 ± 26 | 117 ± 21 | < 0.001 |

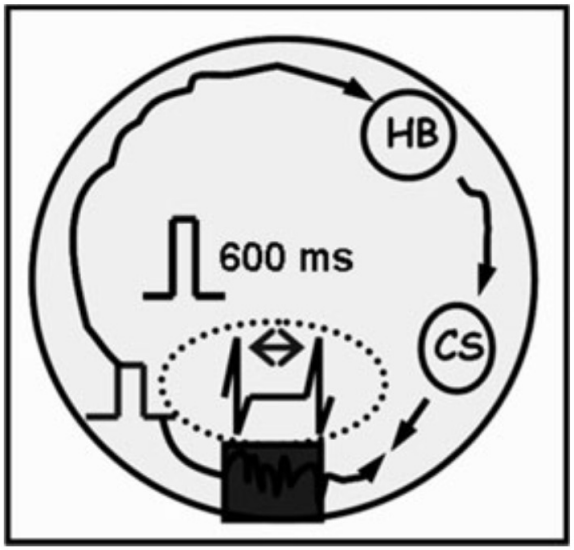


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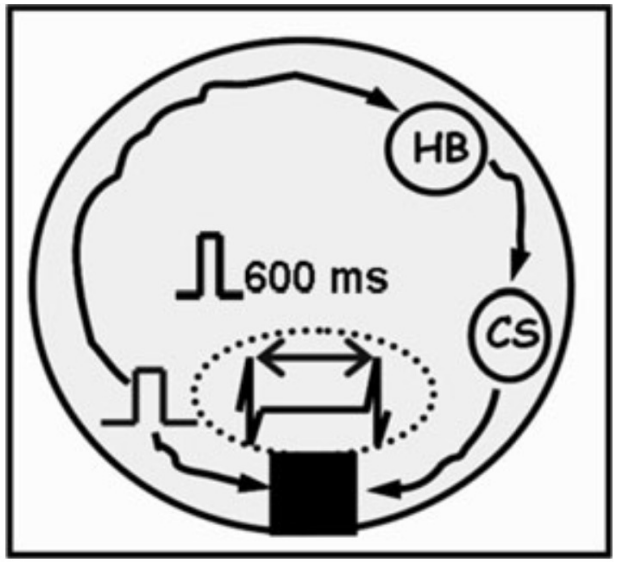
**TABLE 2**

Incremental Pacing During Complete CTI Block (Phase 2)

| | DP @ 600 ms | DP @ 500 ms | DP @ 400 ms | DP @ 300 ms | DP @ 250 ms | P |
|---|---|---|---|---|---|---|
| LLRA | 122 ± 25 | 123 ± 26 | 124 ± 25 | 126 ± 27 | 135 ± 35 | 0.17 |
| CS | 116 ± 20 | 117 ± 19 | 118 ± 20 | 120 ± 20 | 123 ± 20 | 0.21 |

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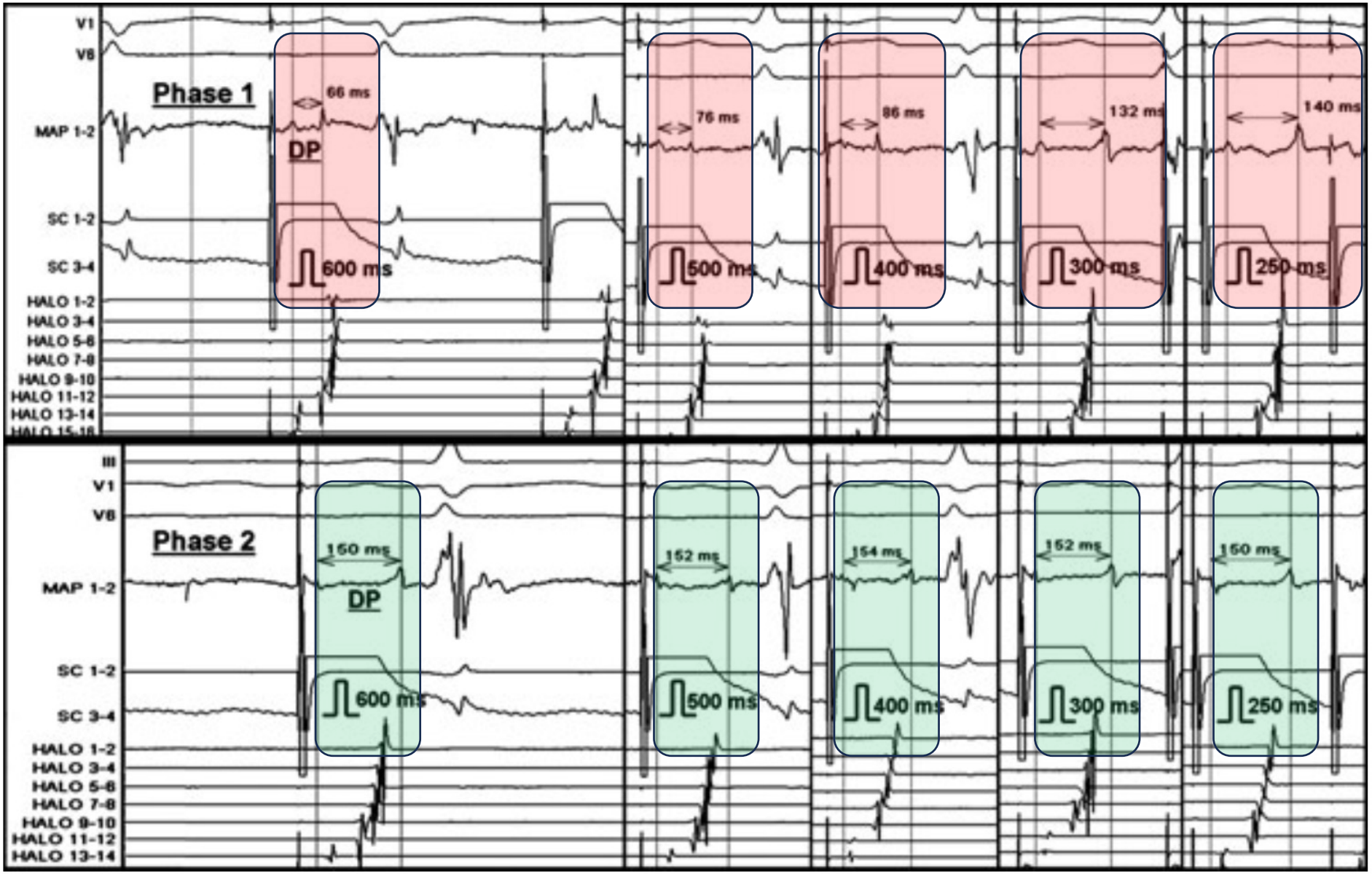

V1
V6
Phase 1
66 ms
DP
MAP 1-2
SC 1-2
SC 3-4
600 ms
76 ms
500 ms
86 ms
400 ms
132 ms
300 ms
140 ms
250 ms
HALO 1-2
HALO 3-4
HALO 5-6
HALO 7-8
HALO 9-10
HALO 11-12
HALO 13-14
III
V1
V6
Phase 2
160 ms
DP
MAP 1-2
SC 1-2
SC 3-4
600 ms
152 ms
500 ms
154 ms
400 ms
152 ms
300 ms
160 ms
250 ms
HALO 1-2
HALO 3-4
HALO 5-6
HALO 7-8
HALO 9-10
HALO 11-12
HALO 13-14

# Incremental His-To-Coronary Sinus Maneuver

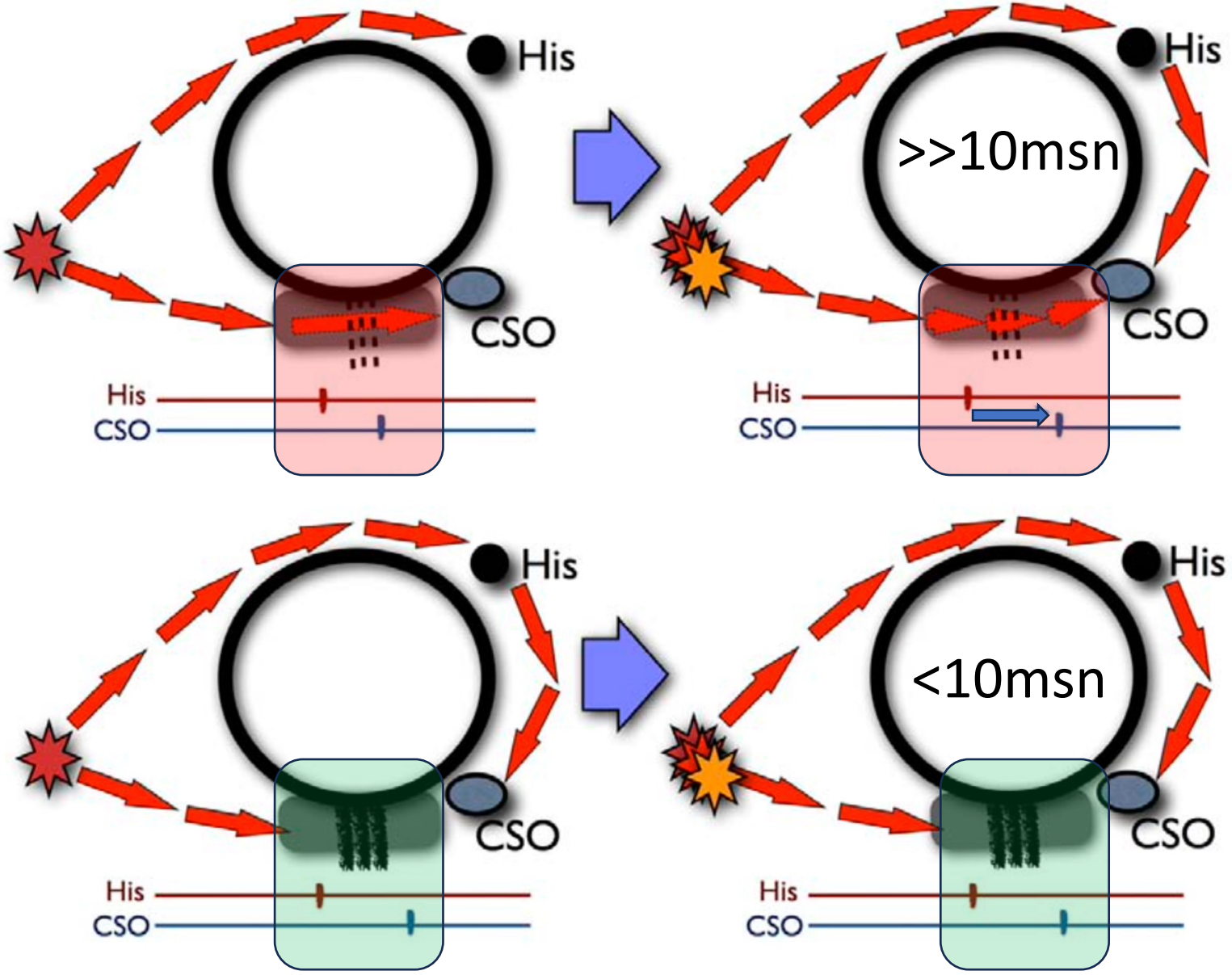
## A Nonlocal Electrogram–Based Technique to Assess Complete Cavotricuspid Isthmus Block During Typical Flutter Ablation

Ermengol Vallès, PhD; Victor Bazán, PhD; Begoña Benito, MD; Miguel Eduardo Jáuregui, MD; Jordi Bruguera, MD; Miguel Angel Guijo, RN; Carmen Altaba, RN; Julio Martí-Almor, PhD

***Background***—Achievement of complete cavotricuspid isthmus (CTI) conduction block reduces typical atrial flutter recurrences after ablation. The lack of increase in the His-to-Coronary sinus ostium atrial interval during incremental pacing (IP) from the low lateral right atrium may distinguish slow conduction from complete CTI conduction block.

***Methods and Results***—Sixty-six consecutive patients (age, 65±13 years; 18% female) were prospectively included. A <10 ms increase in the His-to-Coronary sinus ostium atrial timing during low lateral right atrium IP at cycle length of 600 ms through 300 ms was compared with the previously reported IP maneuver for the confirmation of complete CTI block. On the basis of the IP maneuver, complete CTI block (phase 2) was achieved in 59 patients, in 13 of whom an intermediate phase of functional CTI block (phase 1) was observed. In the remaining 7 patients, the IP maneuver did not allow for assessment of complete CTI block because of the presence of inconclusive potentials in the CTI ablation line. As compared with the IP maneuver, the incremental His-to-Coronary sinus ostium maneuver was consistent with functional CTI block during phase 1 in all cases and conclusive of complete CTI block in 98% of cases during phase 2.

***Conclusions***—The incremental His-to-Coronary sinus ostium maneuver is analogous to the IP maneuver in distinguishing complete CTI block from persistent CTI conduction. This maneuver may provide confirmation of CTI block in those patients in whom assessment of local electrogram–based criteria is not feasible because of inconclusive potentials in the CTI ablation line. **(*Circ Arrhythm Electrophysiol.* 2013;6:784-789.)**


His
CSO
His
CSO
>>10msn
His
CSO
His
CSO
<10msn

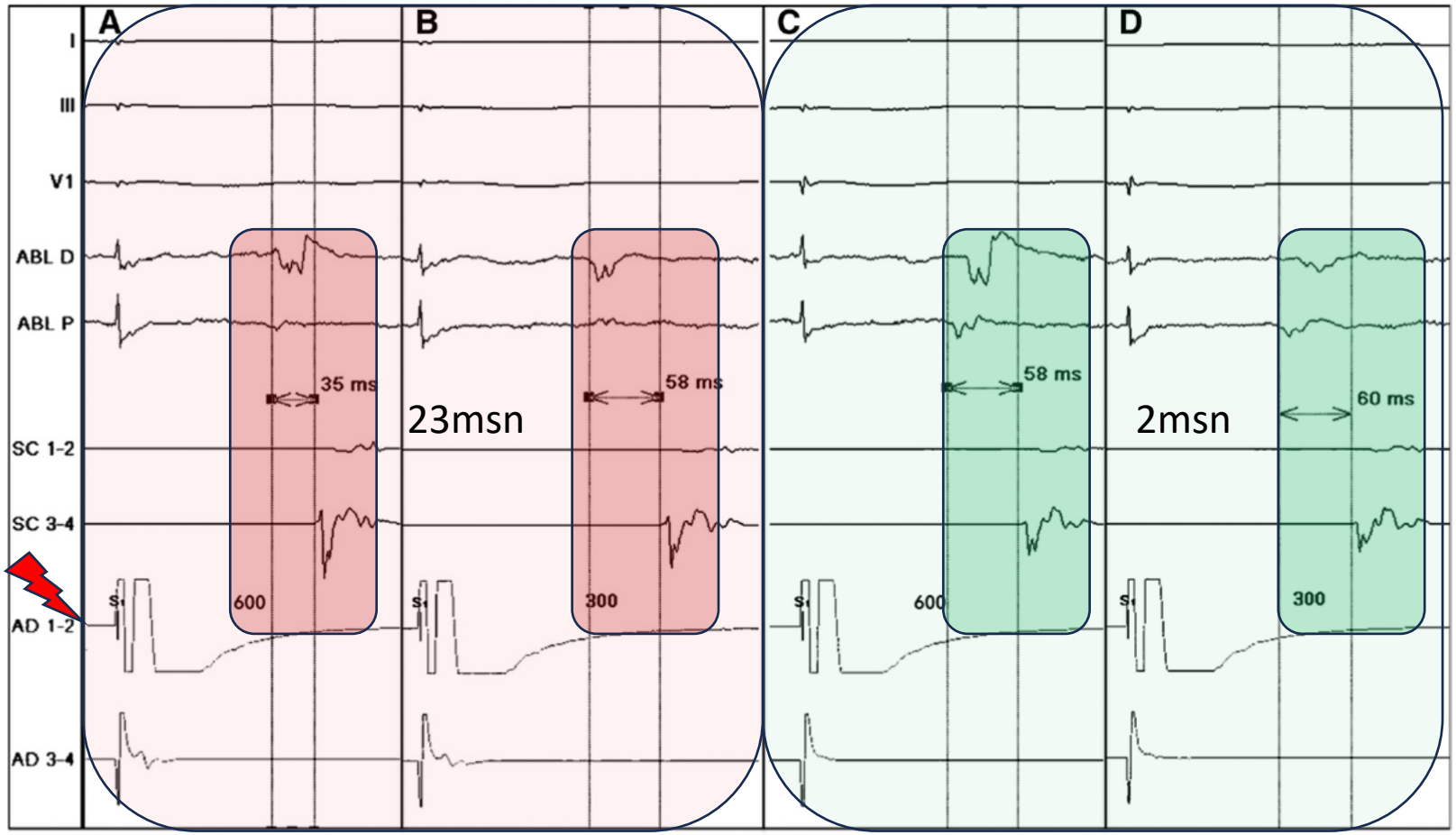



**Figure 2.** Example of the incremental His-to-Coronary sinus ostium (CSO) maneuver. **A** and **B** were registered during Phase 1 cavotricuspid isthmus (CTI) block, and **C** and **D** were registered in the same patient after delivery of additional radiofrequency lesions, and Phase 2 CTI block was achieved. Each panel shows 1 paced beat from different pacing trains. The distal bipole of the ablation catheter (ABL D) was placed at the His-bundle region. **A**, A delay of 35 ms between the atrial electrograms of His and CSO regions during pacing from the low lateral right atrium (LLRA) at a cycle length (CL) of 600 ms. **B**, An increase in this delay to 58 ms (increment of >10 ms) during incremental pacing (IP) down to a CL of 300 ms. In comparison, at the end of the procedure, the timing delay between His and CSO was 58 ms during pacing from the LLRA at a CL of 600 ms (**C**) and 60 ms (increment of <10 ms) during IP down to a CL of 300 ms (**D**). ABL P indicates proximal bipole of the ablation catheter; AD 1–2, distal bipole of the LLRA catheter; AD 3–4, proximal bipole of the LLRA catheter; SC 1–2, distal bipole of the coronary sinus catheter; and SC 3–4, proximal bipole of the coronary sinus catheter.

# Incremental pacing maneuver for atrial flutter recurrence reduction after ablation

## Vallès: Yield of incremental pacing after flutter ablation

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Incremental pacing

ABSTRACT

*Background:* A <20 ms increase in the interval between cavo-tricuspid isthmus (CTI) double potentials during incremental pacing (IP) is a highly specific marker differentiating functional from complete CTI block during typical flutter (AFL) ablation. Long-term effects of IP remain unclear. We aimed to assess the impact of IP in reducing AFL recurrences after CTI ablation.

*Methods:* One hundred and thirty-four patients (age 67 ± 13 years, 78% males) undergoing successful CTI ablation were included and divided into 2 groups: Group 1 (n = 68), in which ablation was performed before the IP maneuver was incorporated, with CTI block confirmed by at least 1 non-local and 1 local electrogram-based previously established criteria; and Group 2 (n = 66), in which IP maneuver was used to confirm complete CTI block.

*Results:* No intergroup differences were noted in baseline characteristics, ablation settings and fluoroscopy/radiofrequency times. Long-term AFL recurrences were observed in 14 out of 134 patients (10.4%), and were more common in Group 1 (19%, vs 1.5% among Group 2 patients, p < 0,001). Despite a longer follow-up period among the former group (1603 ± 734 vs. 964 ± 289 days, respectively), the adjusted AFL recurrence rate was still higher among Group 1 patients (4.3%/year vs. 0.6%/year, p < 0,001). Cox-regression analysis confirmed inclusion in Group 1 as the only predictor of AFL recurrences (HR = 8.2, CI 1.04–64.7, p = 0.046).

*Conclusions:* The addition of the IP maneuver for the diagnosis of complete CTI block reduces AFL long-term recurrences after ablation.

**Table 1**
Assessed

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| His-to-<br>LLRA | m the |
| No or n<br>from | 0 ms) |

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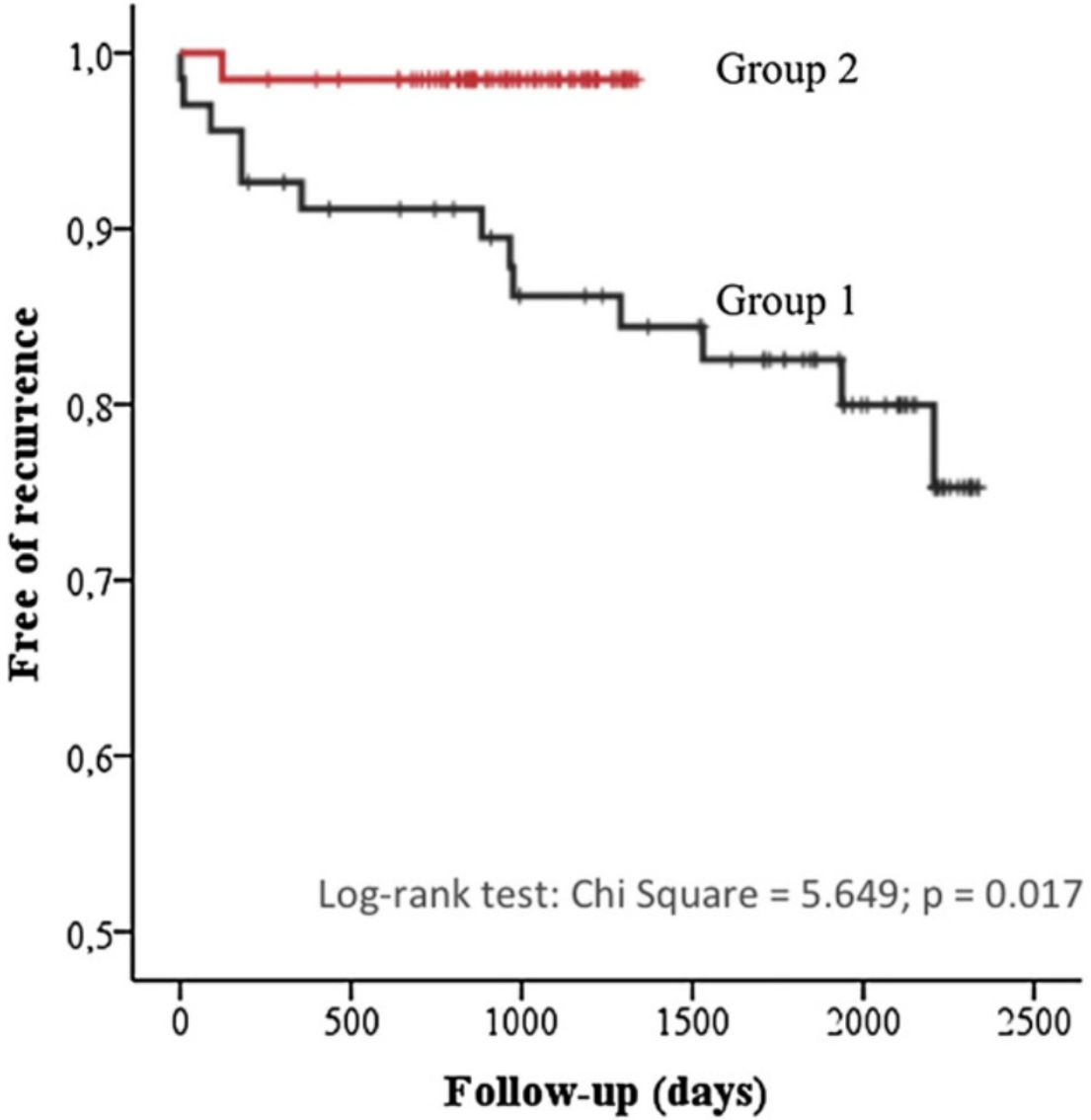


**Fig. 2.** Kaplan–Meier analysis of AFL recurrences depending on the group. Kaplan–Meier analysis demonstrating a significant reduction in AFL recurrences in patients from Group 2 (IP maneuver performed) as opposed to Group 1 (no IP maneuver performed) throughout the follow-up period (Log-rank p = 0.017).

# Achieving bi-directional conduction block during catheter ablation is not enough to prevent recurrence of cavo-tricuspid isthmus dependant atrial flutter: Role of subclinical conduction

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## Abstract

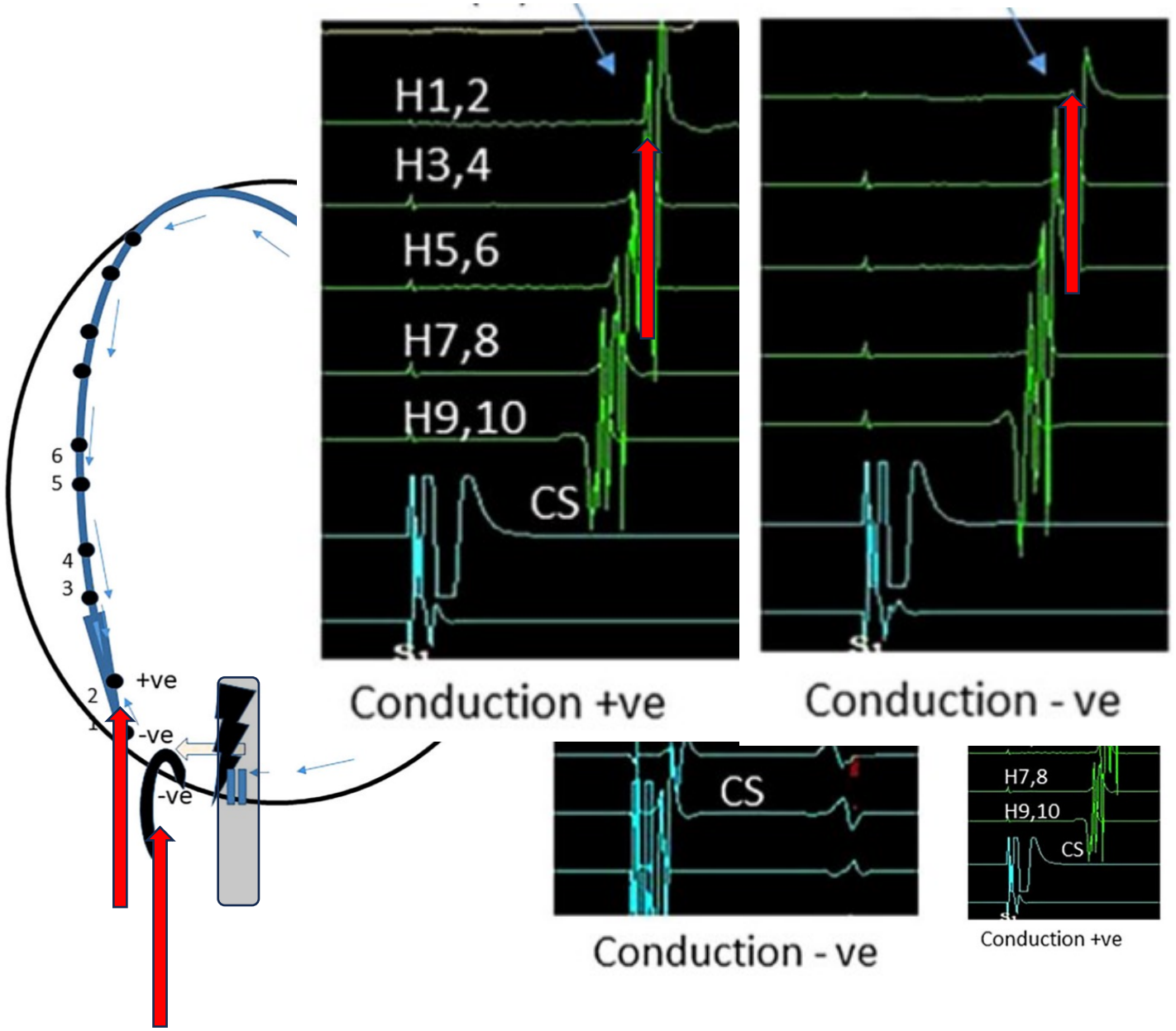
**Background:** Achieving bi-directional conduction block, as assessed by differential pacing and change in activation along tricuspid annulus (TA), across the cavo-tricuspid isthmus (CTI), is considered a satisfactory end point during catheter ablation of atrial flutter (AFL).

**Aim:** To assess role of subclinical conduction by observing polarity reversal of local bipolar signals from RS to QR pattern lateral to the line of ablation, in predicting recurrence of CTI dependant AFL after ablation in patients with bidirectional conduction block.

**Method and Results:** Of 683 patients undergoing ablation of CTI dependent AFL, 73 (10.6%) patients underwent redo flutter ablation and were evaluated further. The mean age was 60.8 years and 51% were males. Evidence of bidirectional block by differential pacing and change is activation along multipolar catheter and reversal of local bipolar signals from RS to QR pattern lateral to the line of ablation, during the 1st and subsequent procedure, were studied. 60% patients had confirmed bidirectional block of which 71% had lack of voltage reversal, at the end of 1st procedure. All patients with bidirectional block with lack of reversal of bipolar signals, after the first procedure had recurrence of AFL whereas only 3/11 (27%) people with bidirectional block and with absence of subclinical conduction had recurrence of AFL.

**Conclusion:** Achieving bidirectional conduction block is not sufficient to prevent recurrence of AFL after CTI ablation. Reversal of local bipolar signals, from RS to QR pattern along with achieving bidirectional conduction delay would reduce recurrence of AFL, post ablation.

KEYWORDS
atrial flutter ablation, polarity reversal, slow conduction


H1,2
H3,4
H5,6
H7,8
H9,10
CS
6
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Conduction +ve
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CS
Conduction - ve
H7,8
H9,10
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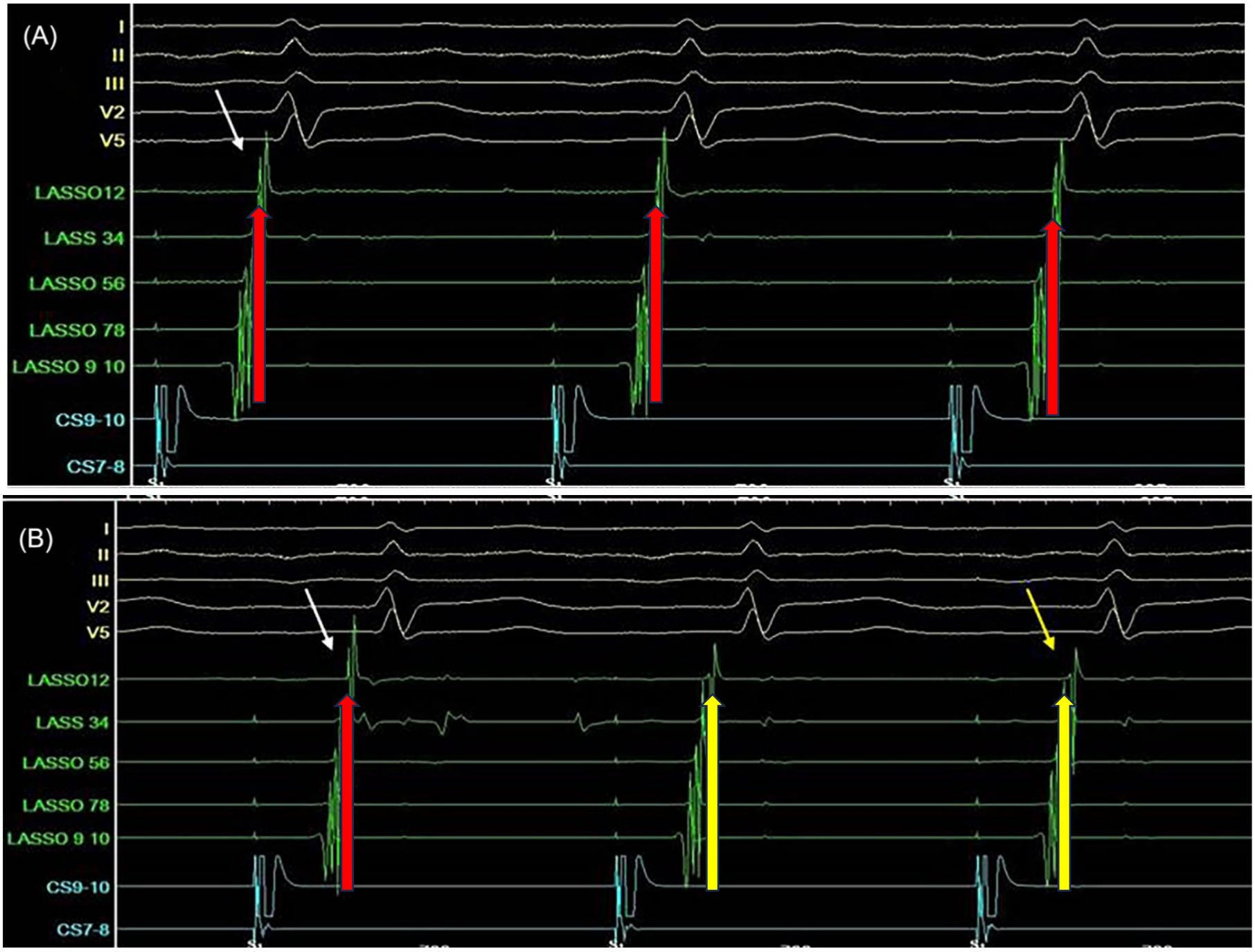
(A)
I
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LASSO 9 10
CS9-10
CS7-8
(B)
I
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CS9-10
CS7-8

# Adenosine Testing in Atrial Flutter Ablation: Unmasking of Dormant Conduction Across the Cavotricuspid Isthmus and Risk of Recurrence

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**Adenosine Unmasking Dormant Conduction Across the Cavotricuspid Isthmus.**

***Background:*** **Adenosine-induced hyperpolarization may identify pulmonary veins at risk of reconnection following electrical isolation for atrial fibrillation. The potential role of adenosine testing in other arrhythmic substrates, such as cavotricuspid isthmus (CTI)-dependent atrial flutter, remains unclear. We assessed whether dormant conduction across the CTI may be revealed by adenosine after ablation-induced bidirectional block, and its association with recurrent flutter.**

***Methods and Results:*** **Patients undergoing catheter ablation for CTI-dependent flutter were prospectively studied. After confirming bidirectional block across the CTI by standard pacing maneuvers, adenosine (≥12 mg IV) was administered to assess resumption of conduction, followed by isoproterenol (ISP) bolus. Further CTI ablation was performed for persistent (but not transient) resumption of conduction. Bidirectional block across the CTI was achieved in all 81 patients (63 males), age 61.2 ± 11.0 years. The trans-CTI time increased from 71.9 ± 18.1 milliseconds preablation to 166.2 ± 26.4 milliseconds postablation. Adenosine elicited resumption of conduction across the CTI in 7 patients (8.6%), 2 of whom had transient recovery. No additional patient with dormant conduction was identified by ISP. Over a follow-up of 11.8 ± 8.0 months, atrial flutter recurred in 4 (4.9%) patients, 3/7(42.9%) with a positive adenosine challenge versus 1/74 (1.3%) with a negative response, P = 0.0016 (relative risk 31.7).**

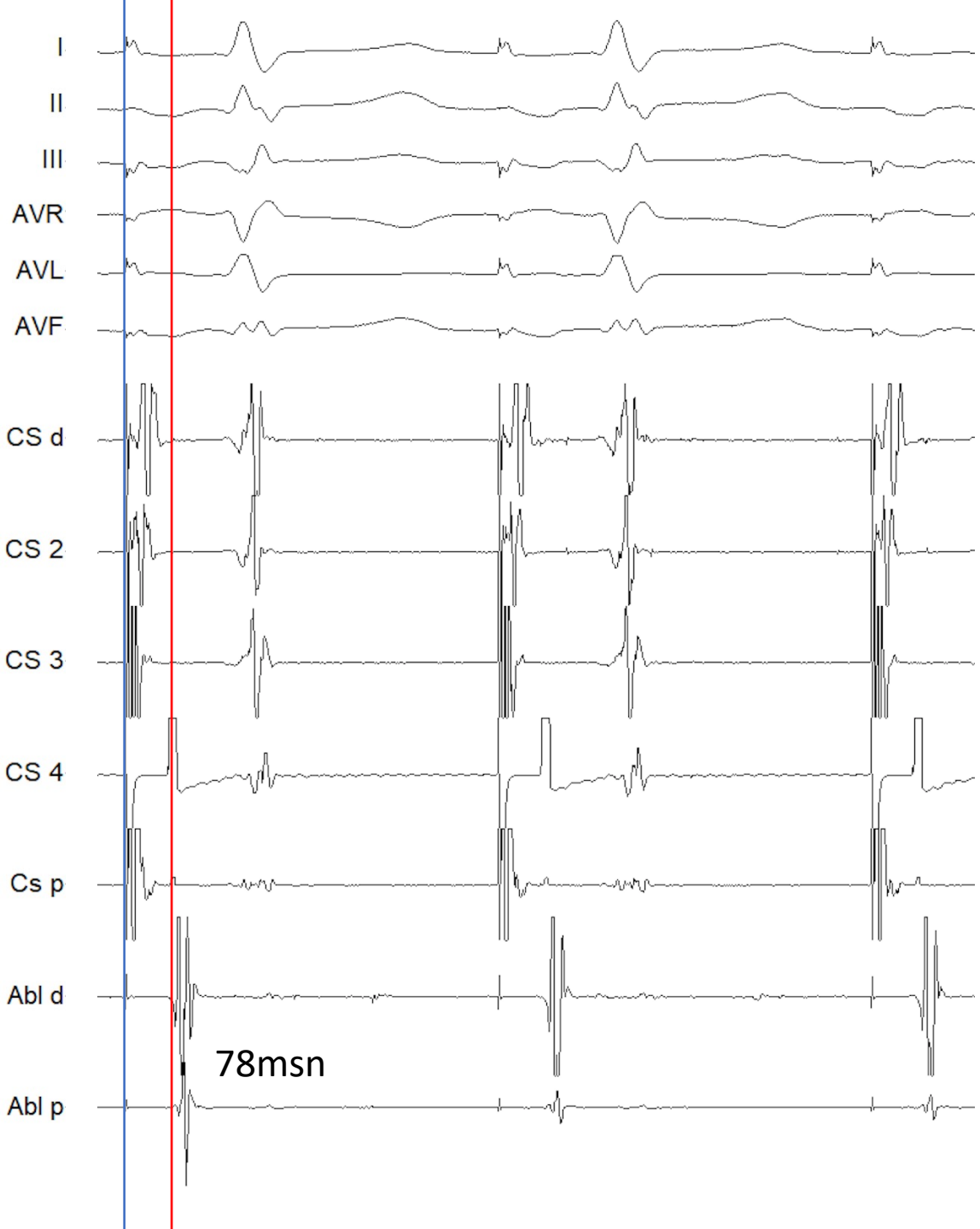
***Conclusion:*** **Adenosine challenge following atrial flutter ablation provoked transient or persistent resumption of conduction across the CTI in almost 9% of patients and identified a subgroup at higher risk of flutter recurrence. It remains to be determined whether additional ablation guided by adenosine testing during the index procedure may further improve procedural outcomes.** *(J Cardiovasc Electrophysiol, Vol. 24, pp. 995-1001, September 2013)*

**TABLE 1**

Patient Characteristics by Response to Adenosine

| Characteristics | Dormant Conduction with Adenosine (N = 7) | No Dormant Conduction with Adenosine (N = 74) | P Value |
|---|---|---|---|
| Age in years | 59.6 ± 11.4 | 61.3 ± 11.1 | 0.69 |
| Male gender | 5 (71.4%) | 58 (78.4%) | 0.65 |
| History of hypertension | 3 (42.9%) | 39 (52.3%) | 0.71 |
| History of diabetes mellitus | 1 (14.3%) | 9 (12.2%) | 1.00 |
| History of coronary artery disease | 1 (14.3%) | 11 (14.9%) | 1.00 |
| Atrial fibrillation with flutter | 1 (14.3%) | 5 (6.8%) | 0.43 |
| Patient on anti arrhythmic drugs | 2 (28.6%) | 25 (33.8%) | 1.00 |
| Left ventricular ejection fraction percent* | 48.6 ± 20.2 | 48.3 ± 16.0 | 0.95 |
| Ablation procedure | | | |
| Normal sinus rhythm at presentation | 5 (71.4%) | 48 (64.9%) | 1.00 |
| Atrial flutter cycle length in milliseconds | 230 ± 28 | 236 ± 25 | 0.76 |
| Transisthmus time in milliseconds preablation | 67.1 ± 15.0 | 72.7 ± 18.5 | 0.46 |
| Transisthmus time in milliseconds postablation | 170 ± 28 | 166 ± 26 | 0.71 |
| Adenosine dose in mg* | 14.6 ± 4.7 | 14.2 ± 4.6 | 0.77 |
| Fluoro time in minutes | 23.3 ± 14.0 | 17.6 ± 7.7 | 0.33 |
| Ablation time in minutes* | 23.2 ± 10.2 | 19.0 ± 38.0 | 0.023 |
| Duration of follow-up in months | 12.0 ± 7.0 | 11.4 ± 8.2 | 0.85 |
| Flutter recurrence during follow-up | 3 (42.9%) | 1 (1.3%) | 0.0016 |

VAKA-1



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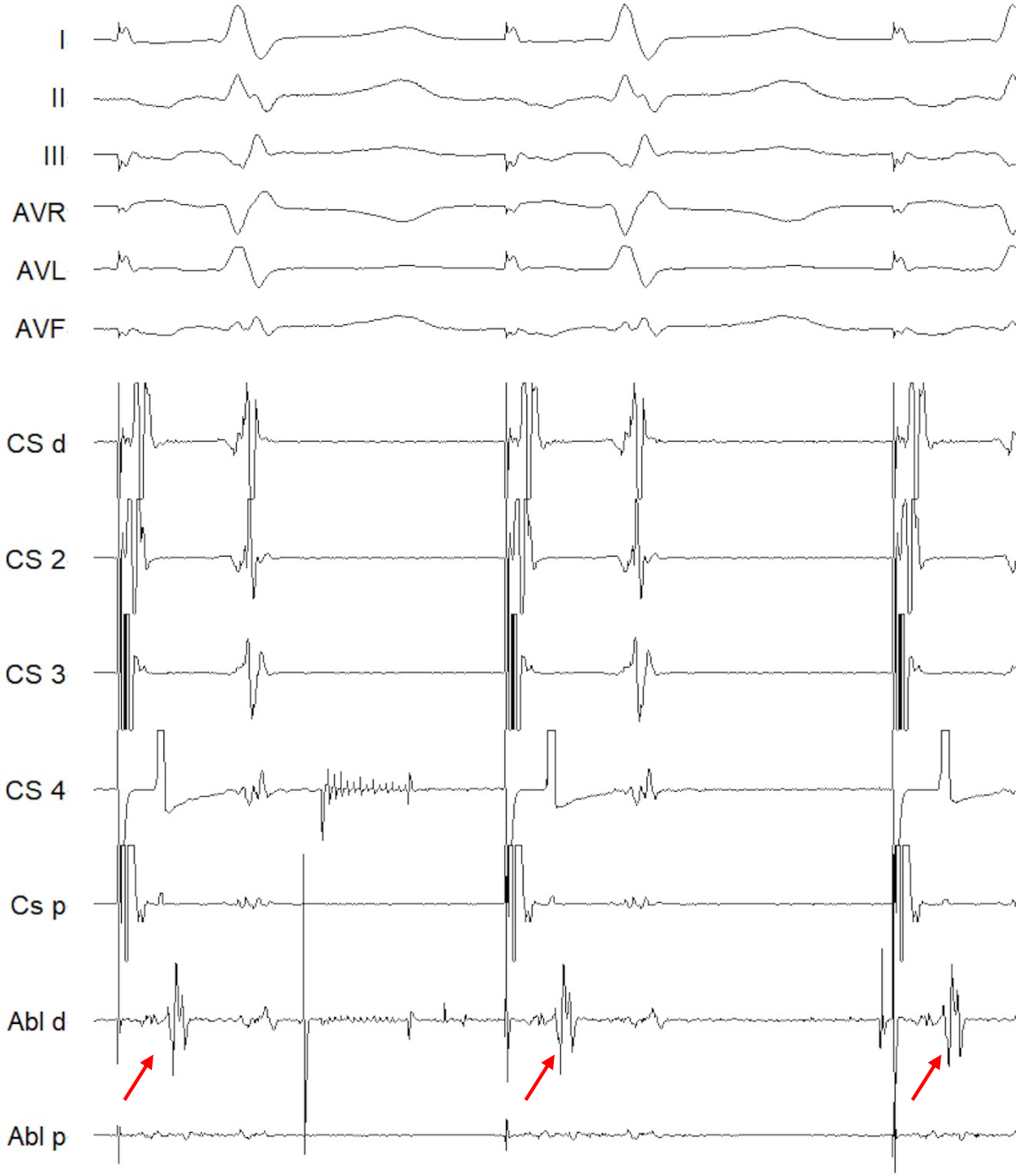

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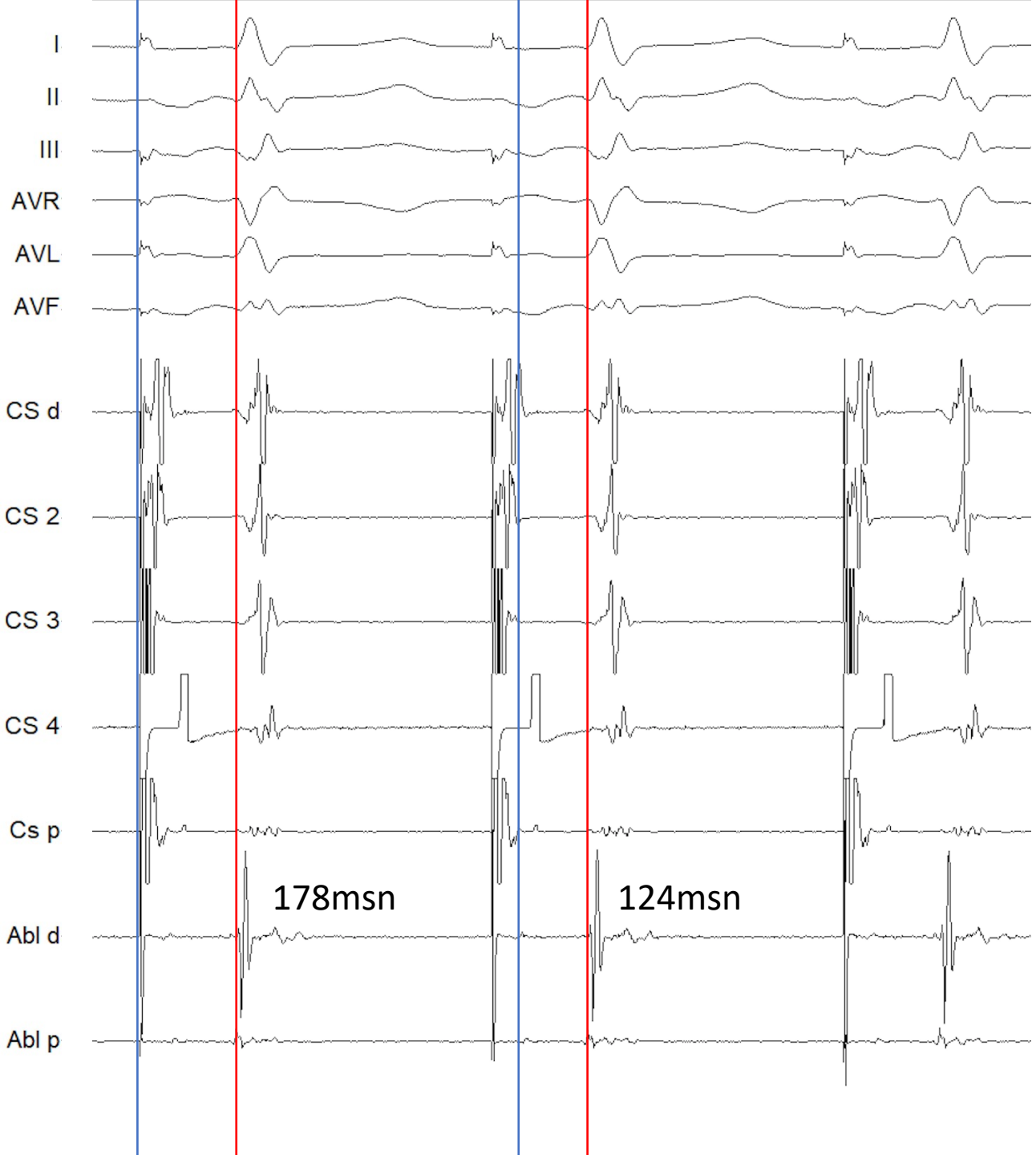
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CS 4
Cs p
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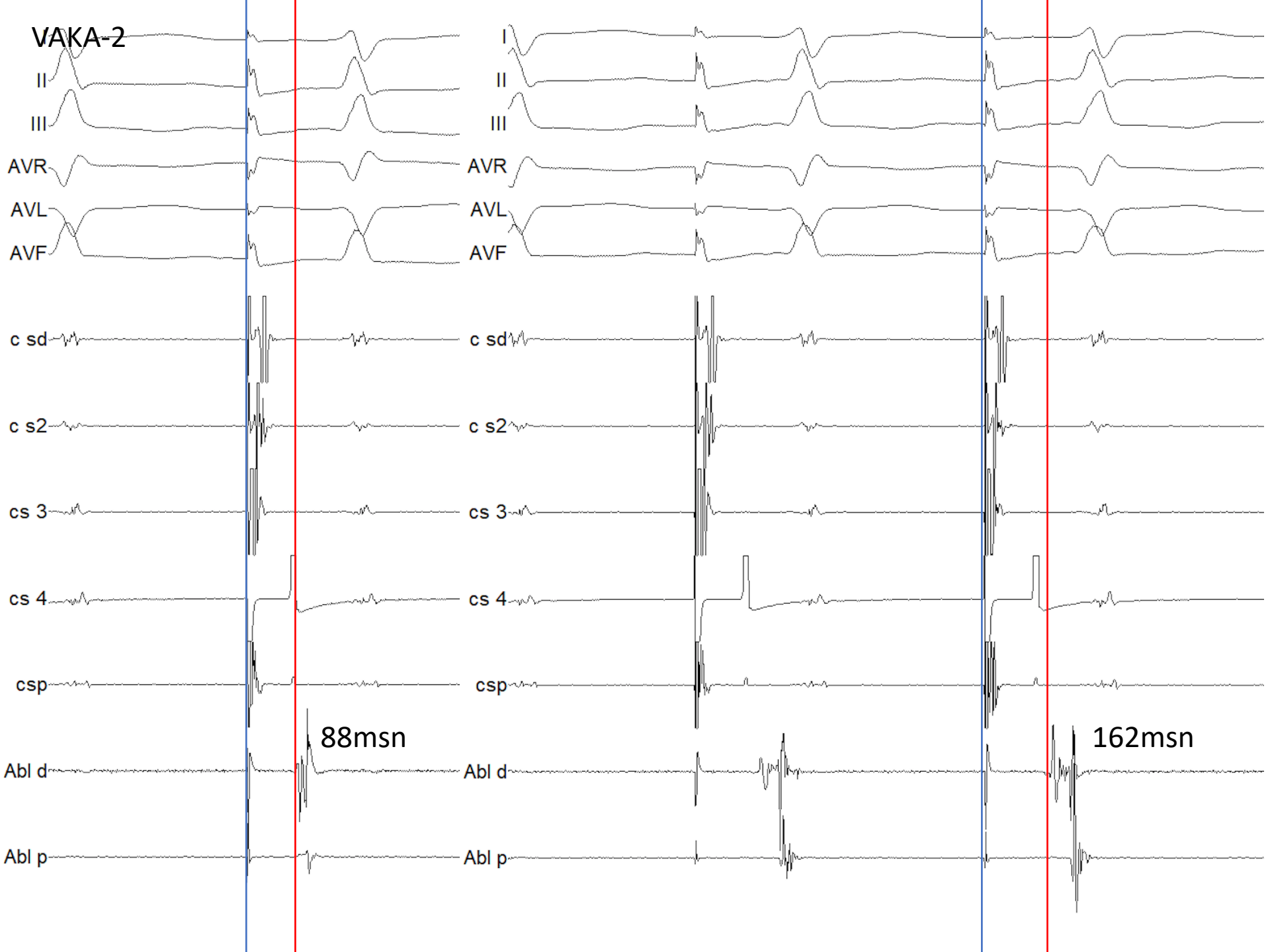
VAKA-2
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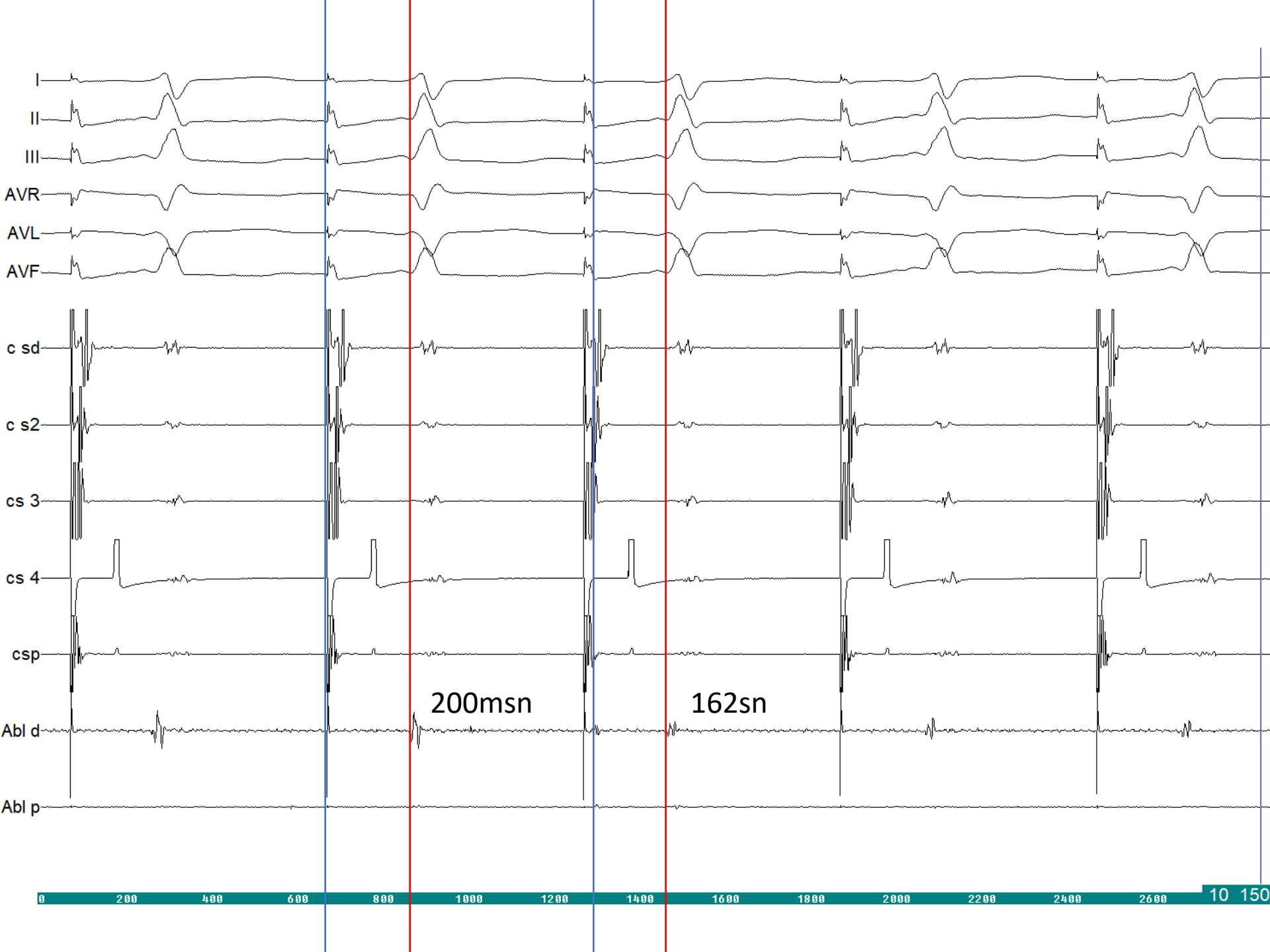
162msn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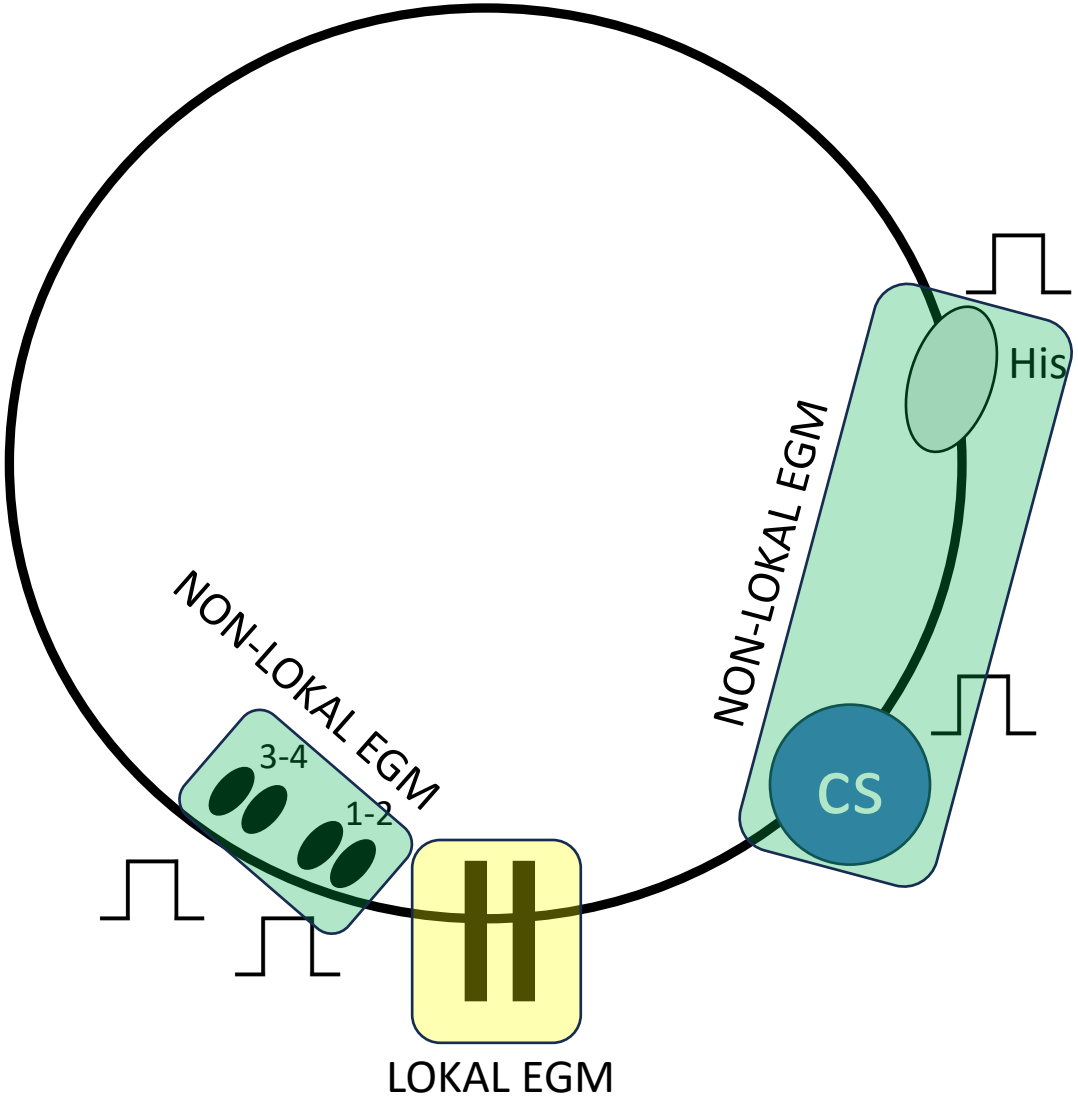
His
NON-LOKAL EGM
NON-LOKAL EGM
3-4
1-2
CS
LOKAL EGM

# LOKAL EGM KRİTERLERİ

- DP mapping
- Differential pacing, DP mapping
  - CS-His
  - LLRA 1-2/LLRA 3-4
- CS pacing DP mapping
  - <90, 90-110, >110msn, izoelektrik hat, QS patern
- Incremental pacing (IP)
  - DP , <20ms DP
- Polarity reversal
  - Abl d,  A EGM: RS>QS

# NON-LOKAL EGM KRİTERLERİ

- CS pacing, Lateral RA ve CTI hat, sequential ileti
- LLRA pacing, Septum ve CTI hat, sequential ileti

- LLRA pacing, 600msn, His to CS timing
  - >40msn, komplet blok

- Incremental pacing, His to CS timing
  - >10msn artış, persistan ileti

- Polarity reversal,
  - CS pacing, LLRA 1-2 reversal

TEŞEKKÜRLER…