



Electrophysiological study (EPS) - indications and course

EPS

- Electrophysiological study is an invasive examination of the heart, performed to accurately diagnose the type of arrhythmia or depolarization/repolarization disorders.



EPS is part of most ablation procedures with the exception of:



Pulmonary veins isolation (PVI)



Ablation of atrial extrasystole



Ablation of ventricle extrasystole



Atrioventricular node ablation



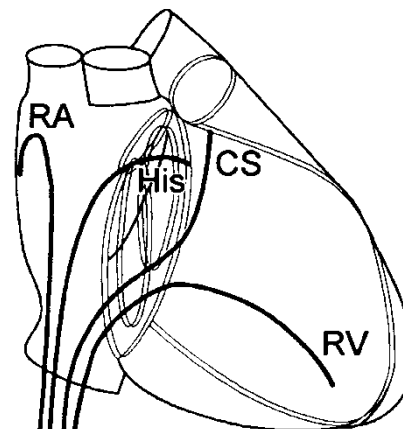
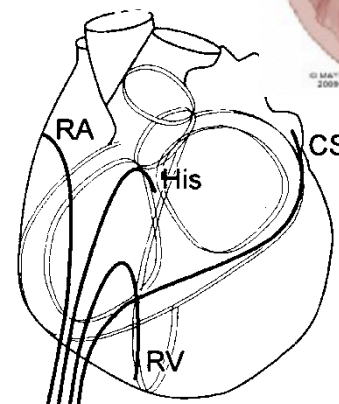
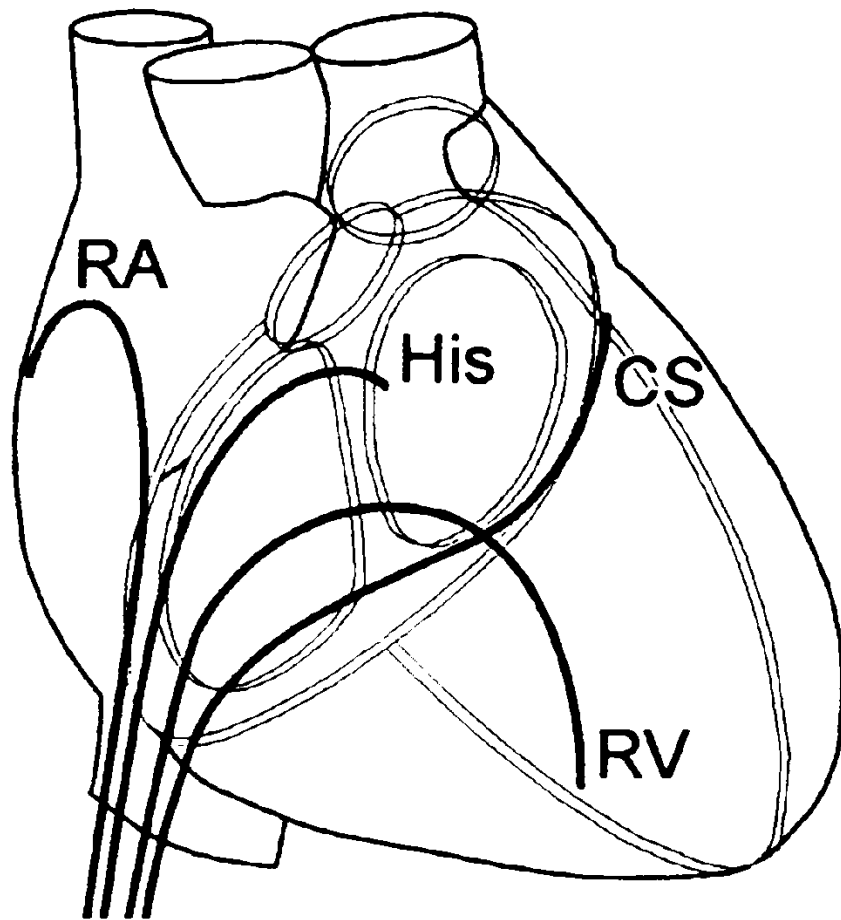
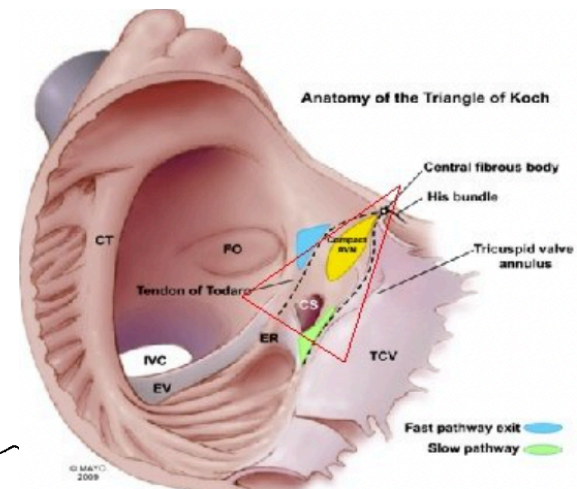


The course of EPS

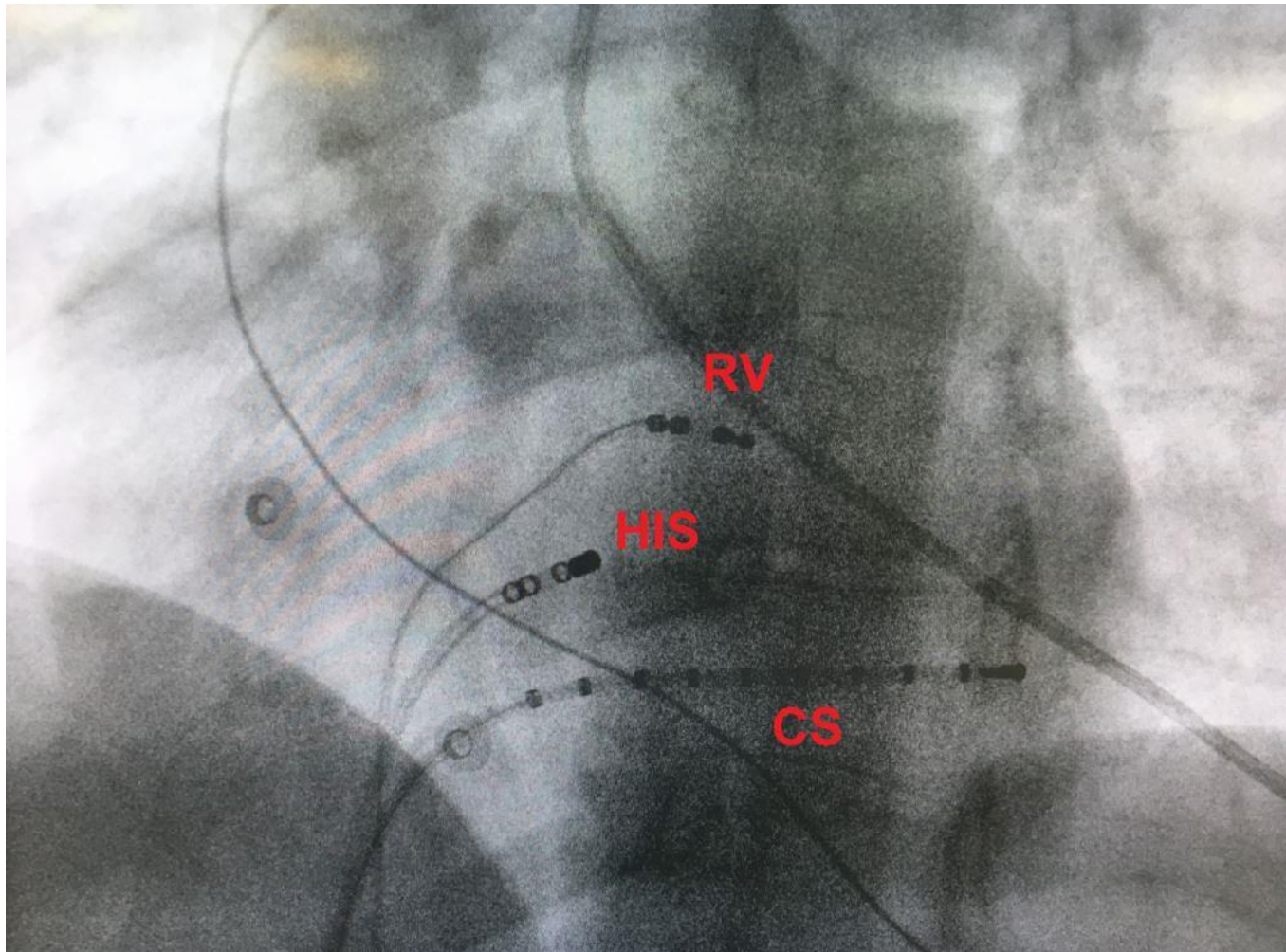
Catheters

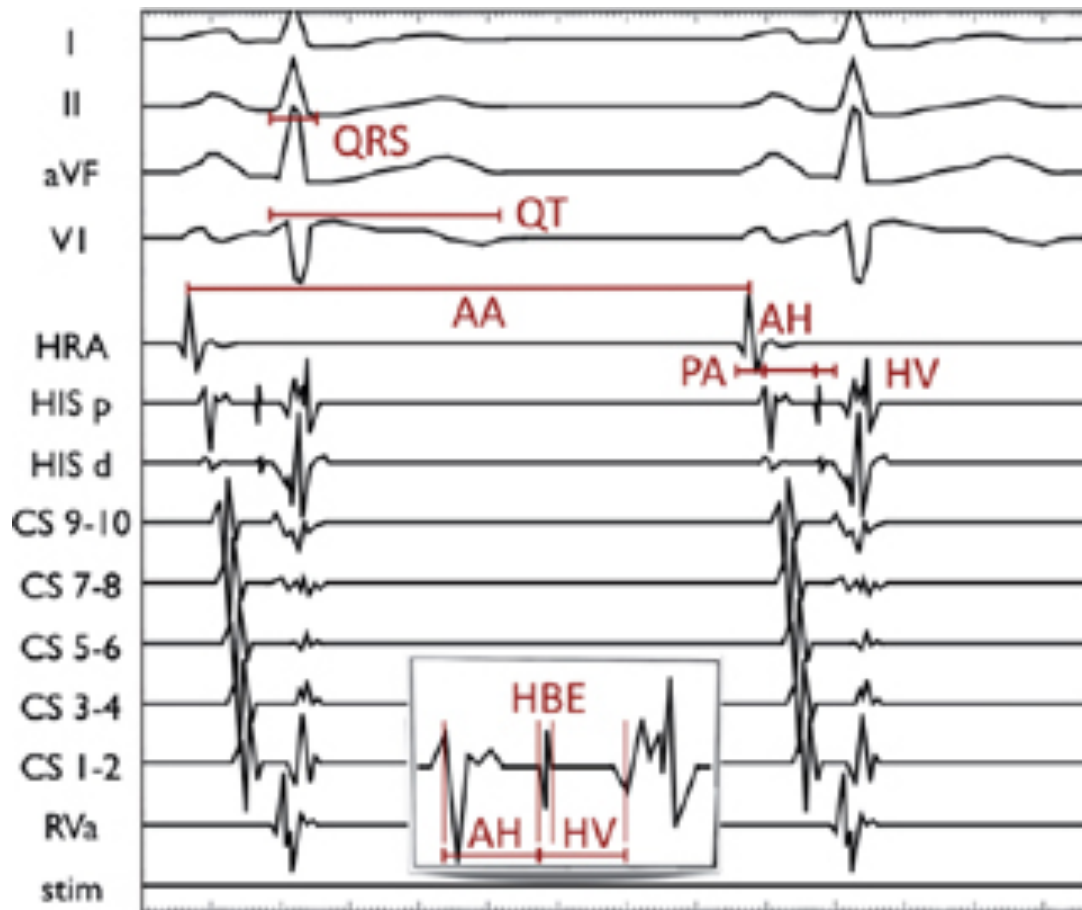


Catheters



Catheters





Conduction Intervals

PA: 25–55 ms
 AH: 55–125 ms
 HBE: <30 ms
 HV: 35–55 ms

Sinus Node Function

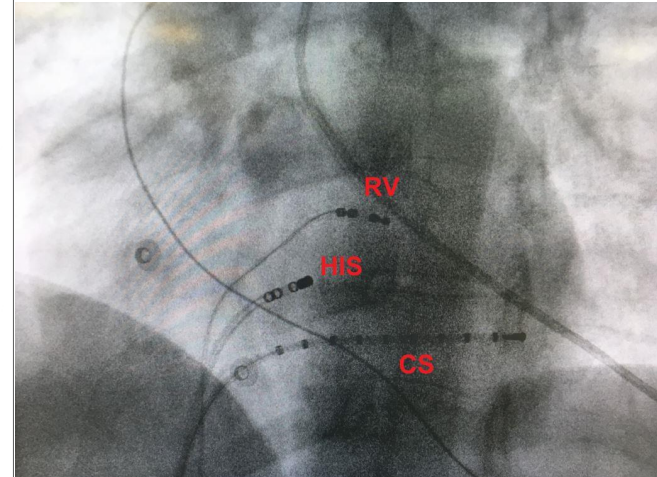
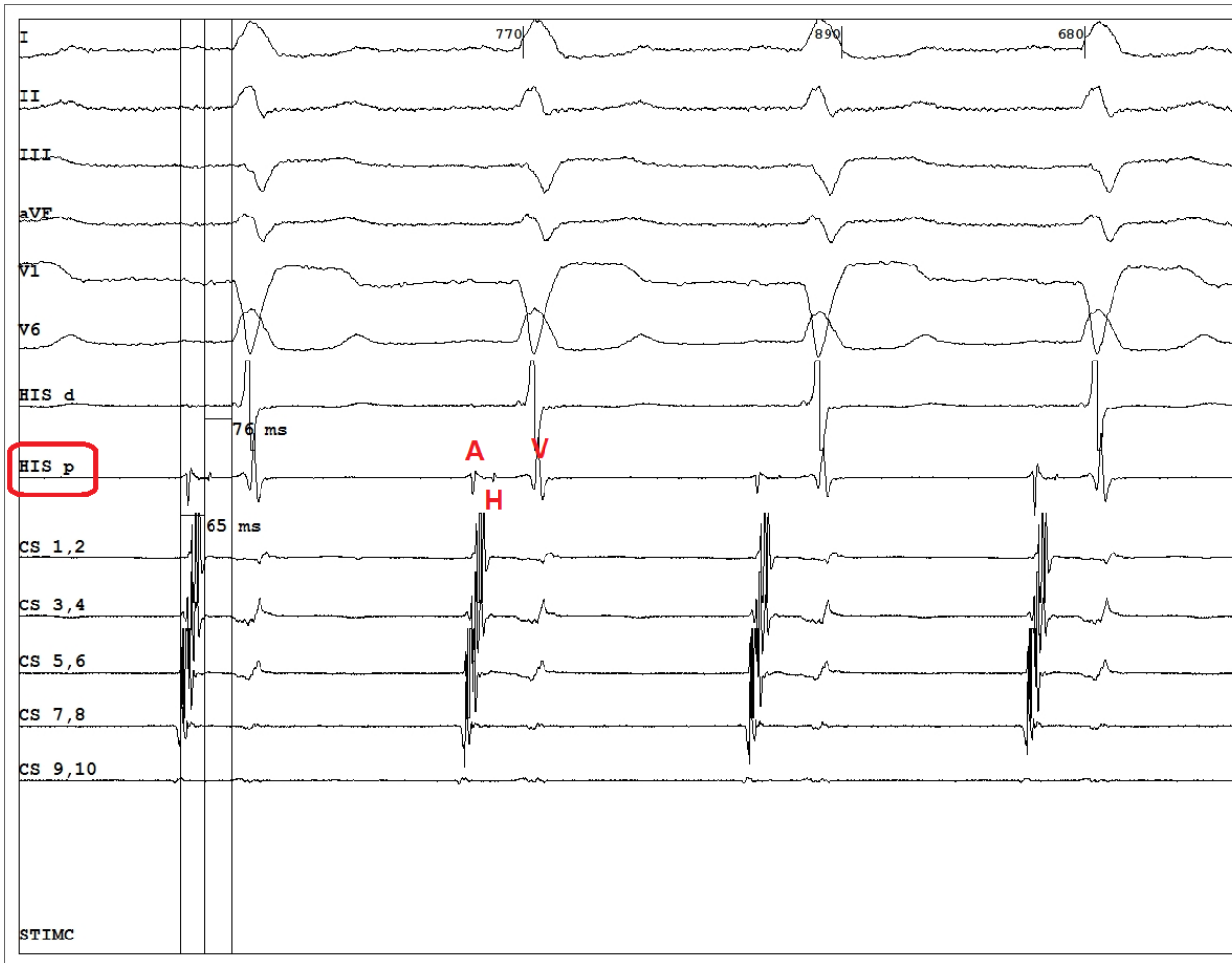
Maximum SNRT: ≤ 1.5 sec
 CSNRT: <550 ms
 Maximum TRT: ≤ 5 sec
 SACT: 50–115 ms

Refractory Periods

Atrial ERP: 180–330 ms
 AV Nodal ERP: 250–400 ms
 (anterograde)
 AV Nodal FRP: 330–550 ms
 Ventricular ERP: 180–290 ms



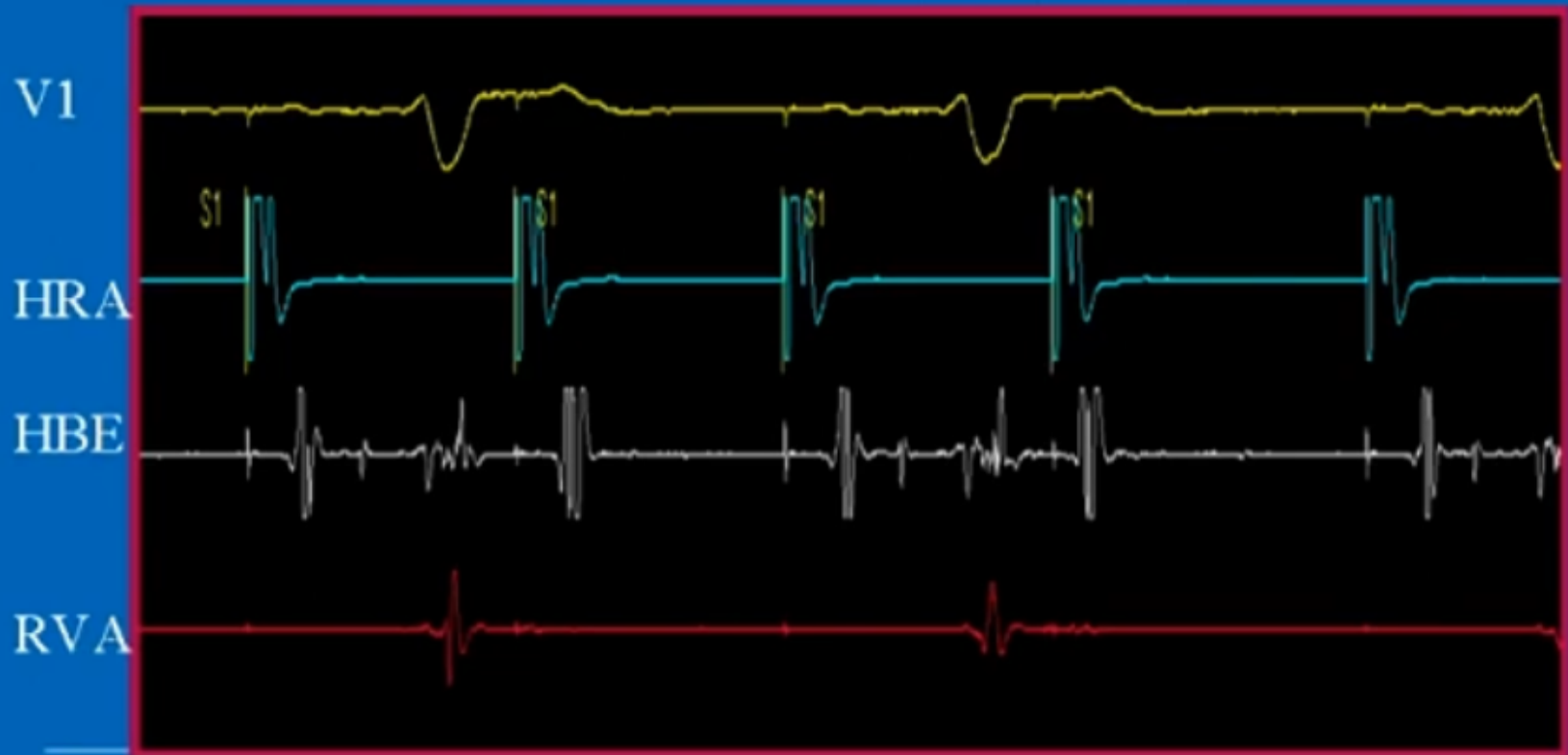
HV interval



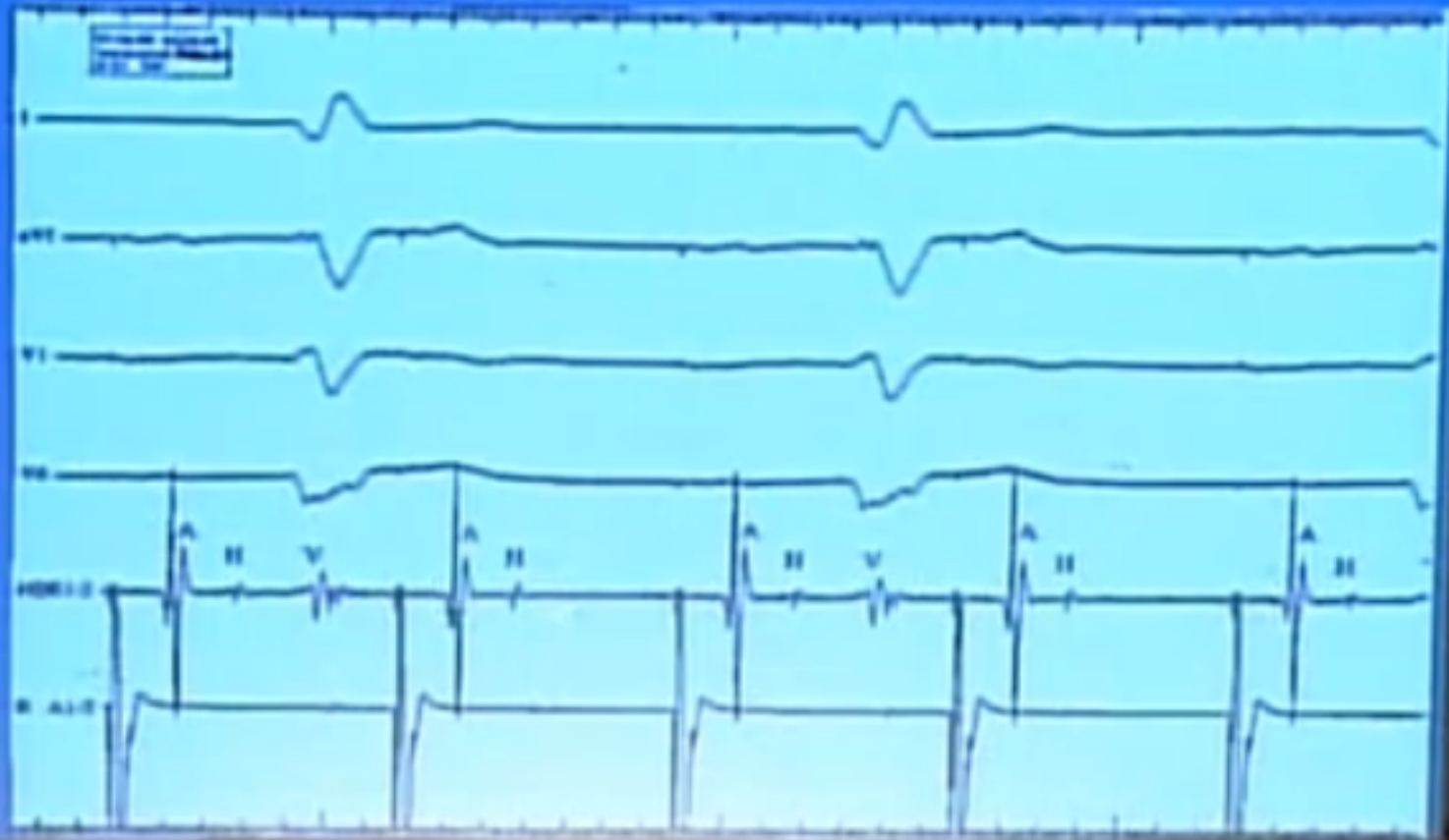
- Normal HV: 35-55ms
- Pathological HV: >70ms
- Pathological HV: >110-120ms (after flecainid infusion- provocative test)

Where is the site of block?

- A. AV node*
- B. Intra His*
- C. Infra His*
- D. AV node and Infra His*

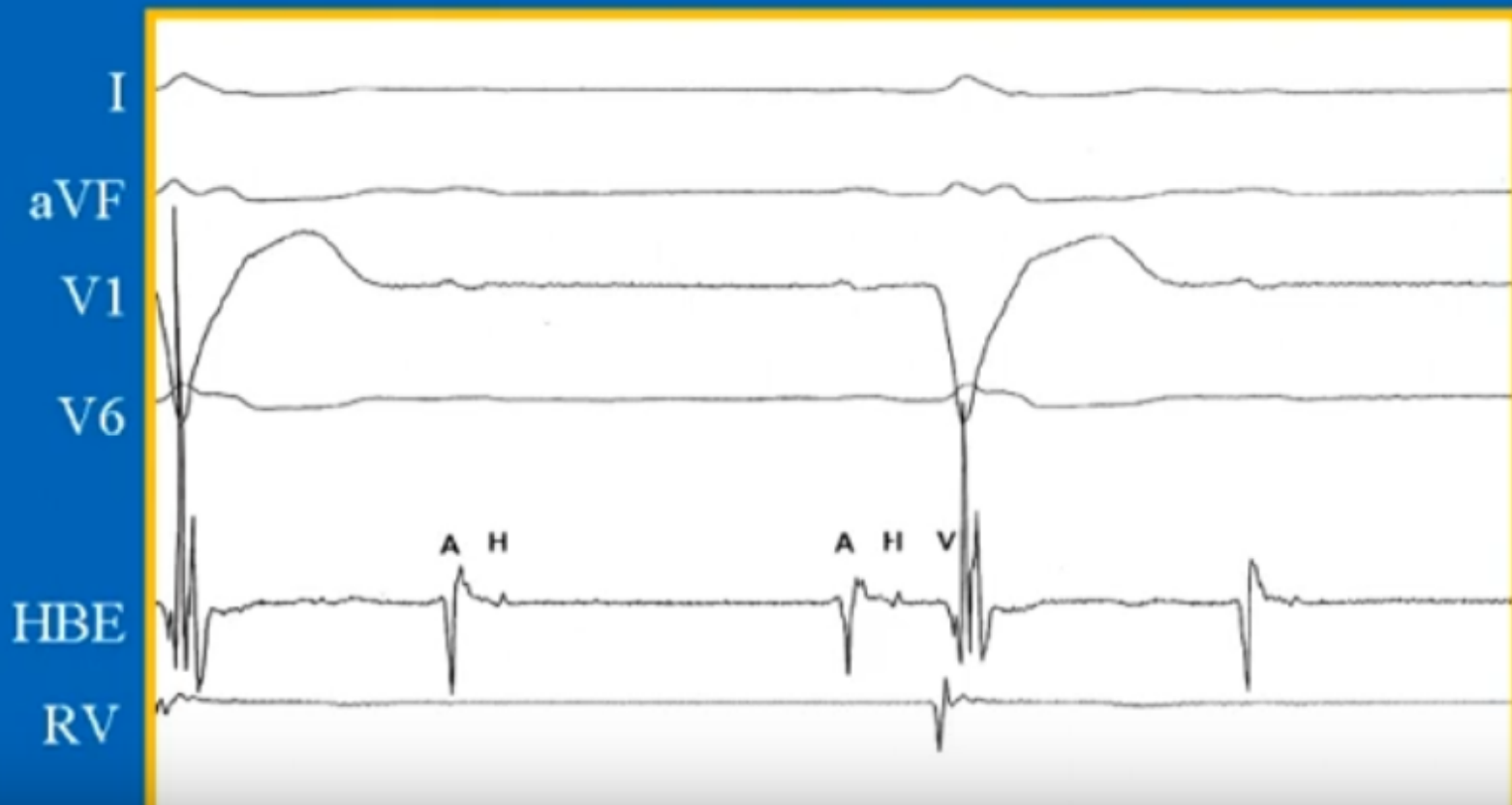


2:1 AVB during A pacing Infra-His block



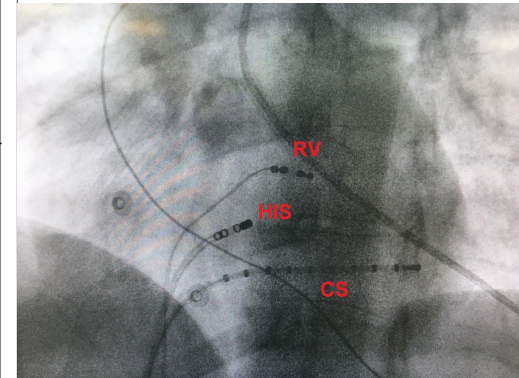
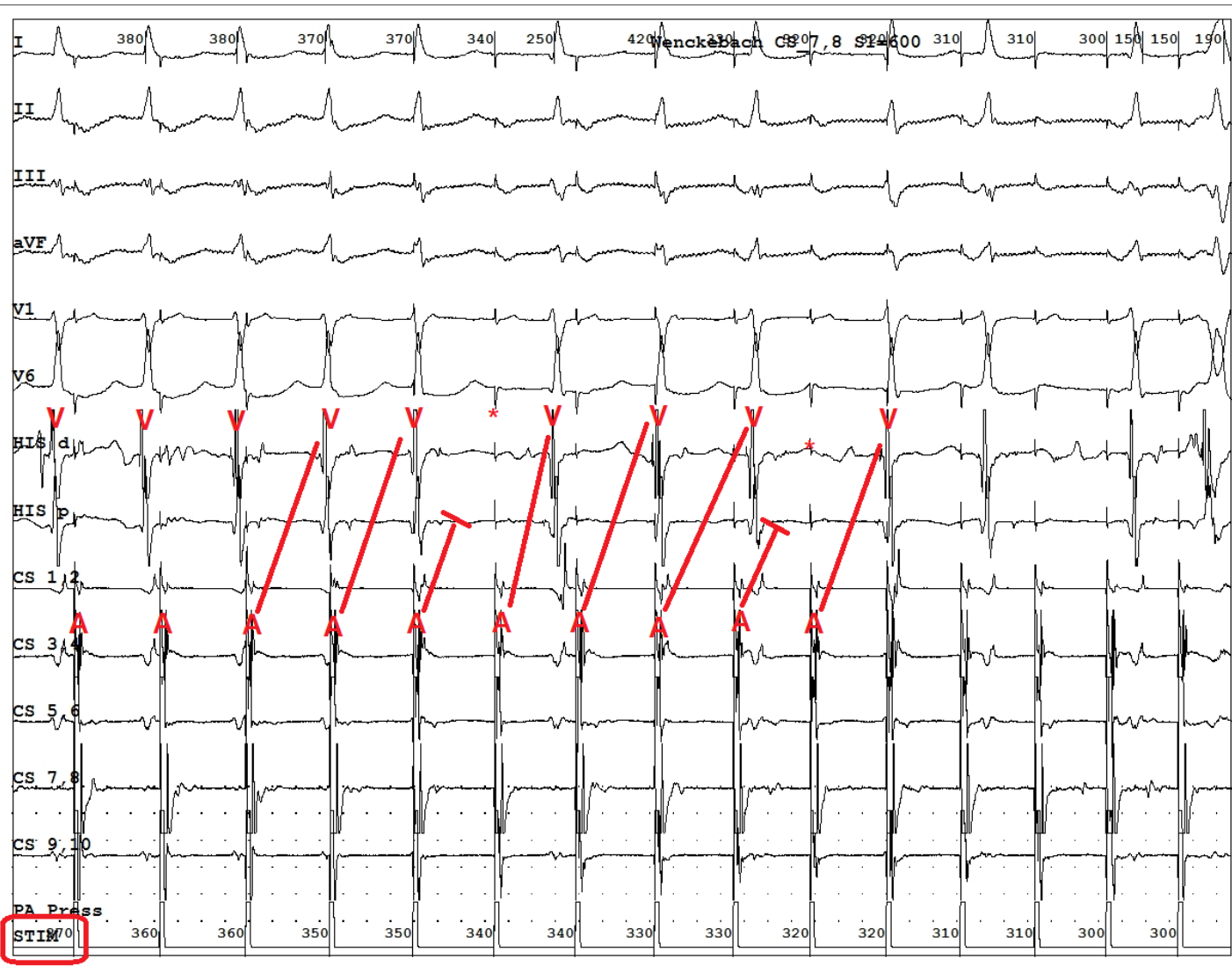
Where is the site of block?

- A. AV node
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Procainamide 10 mg/kg IV

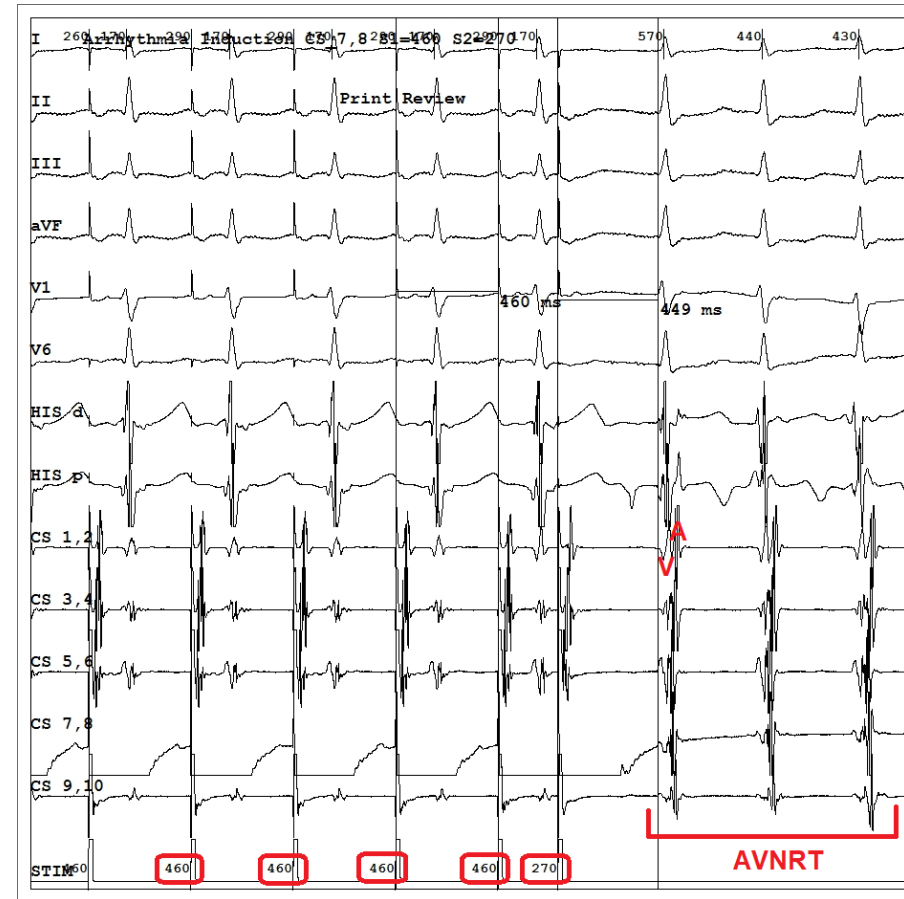
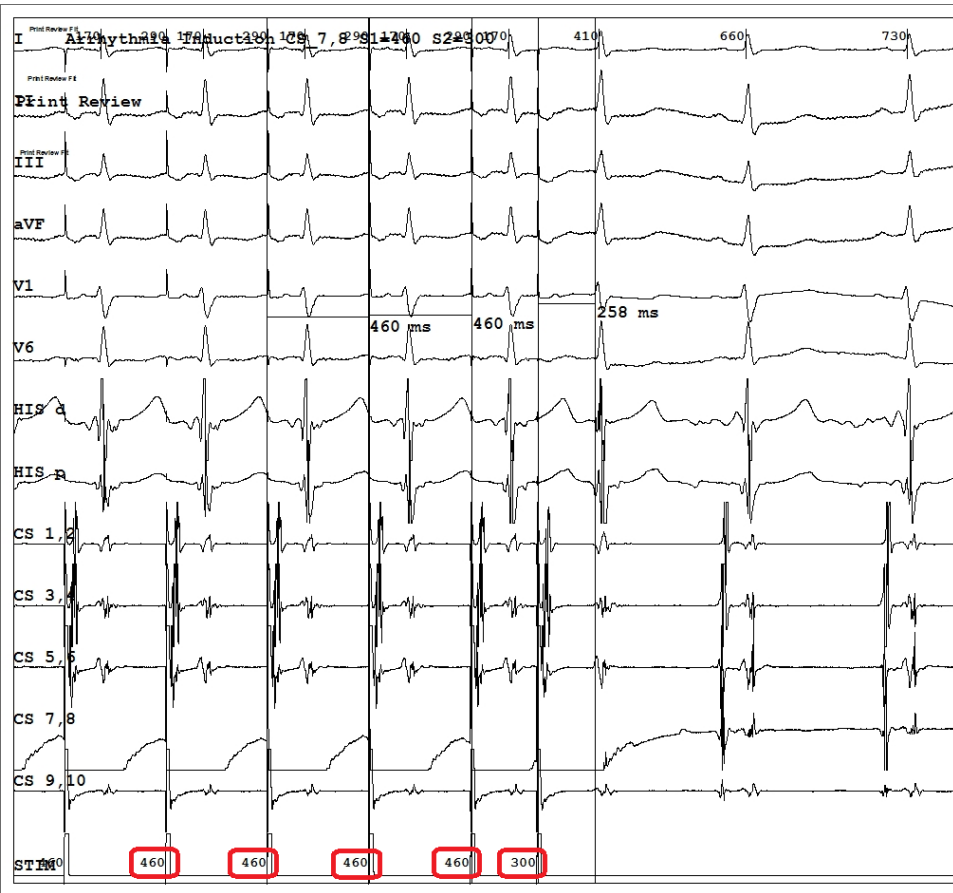
Wenckebach point



WP 350-450ms

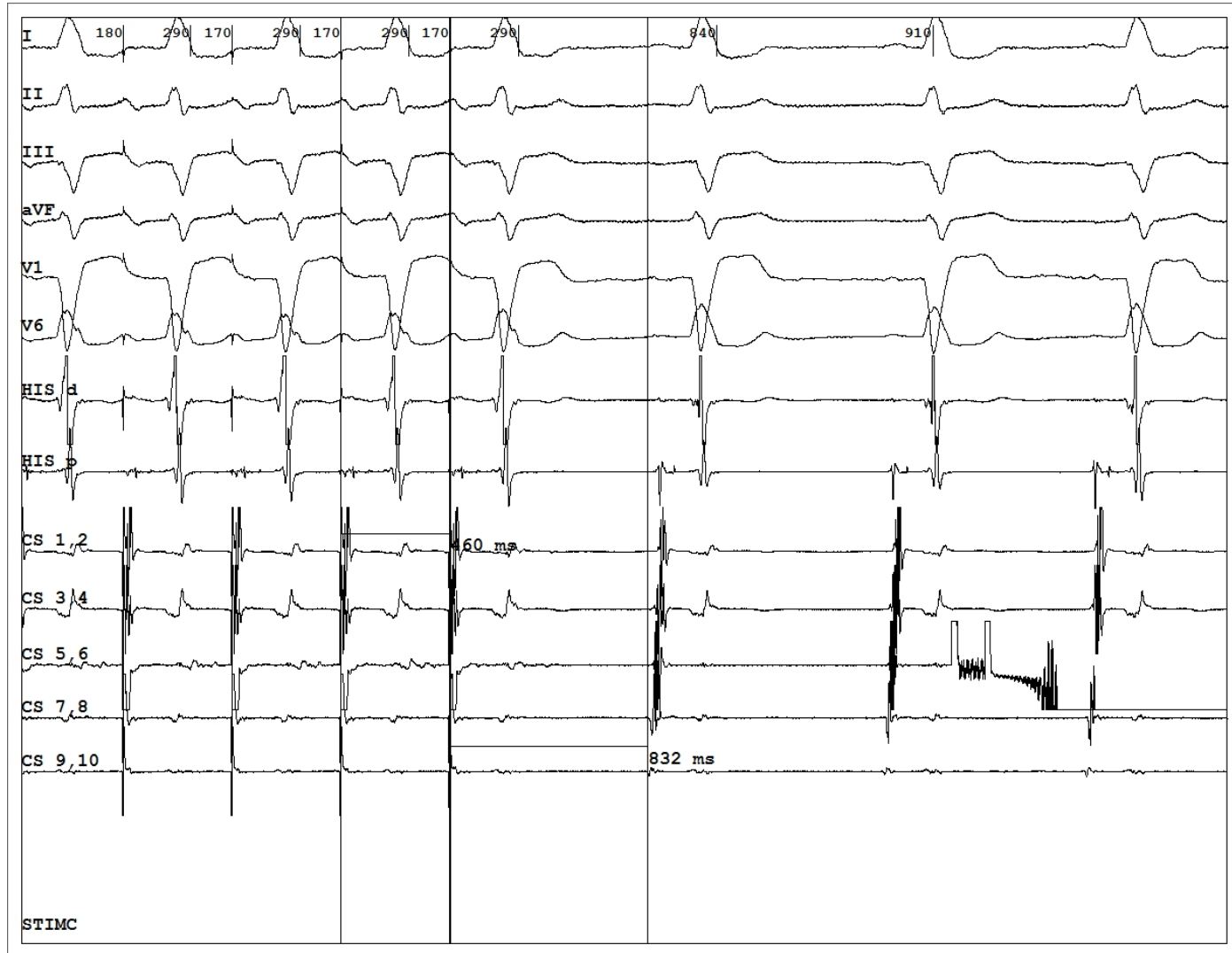


Dual AVN physiology



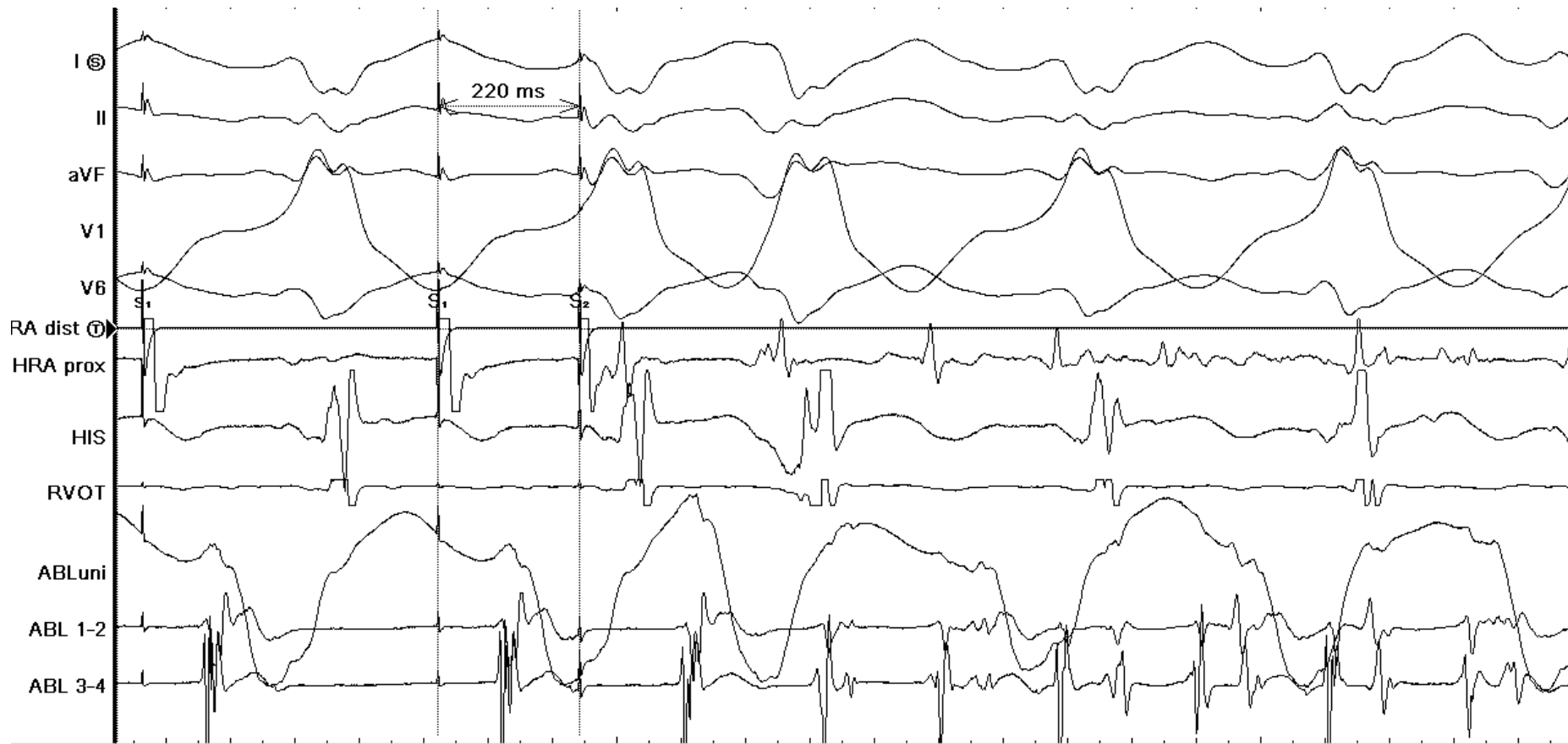
- ERP (effective refractory period) FP (fast pathway): 270ms

Electrophysiological testing of sinus node function



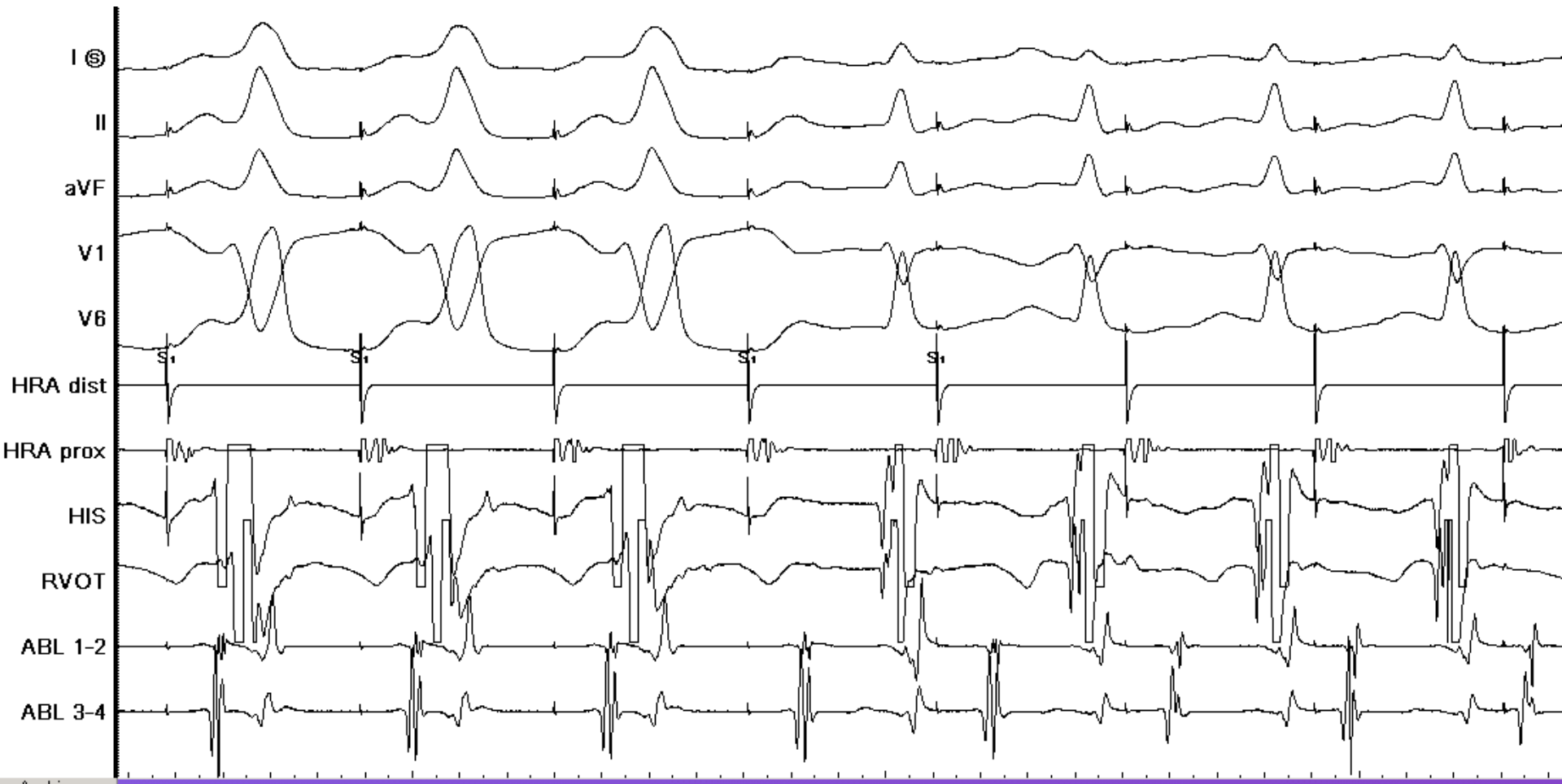
- SNRT: <1500ms
- cSNRT: <500-550ms

Accessory pathway assesment



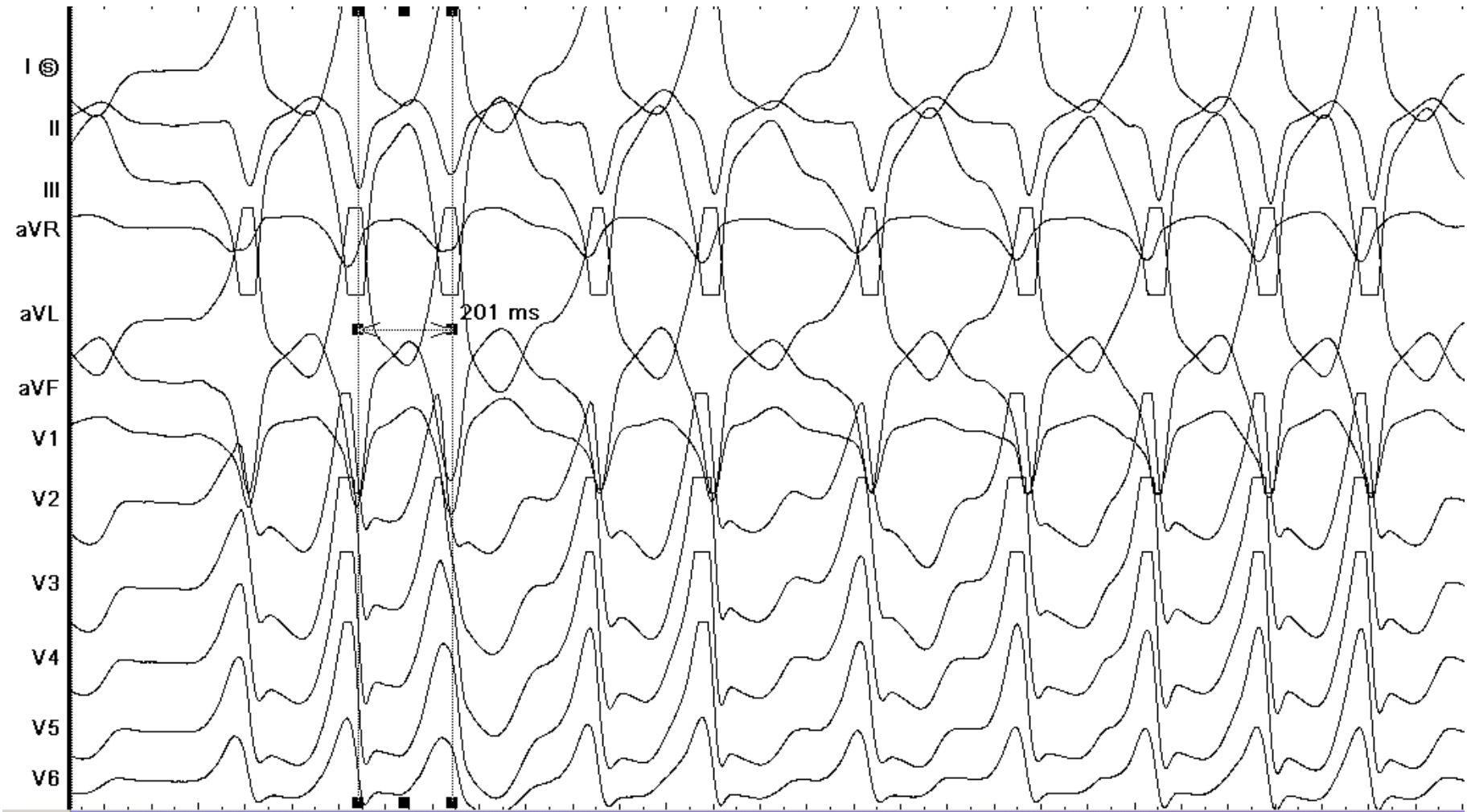
- ERP AP (*effective refractory period accessory pathway*) <250ms = high-risk properties

Accessory pathway assesment



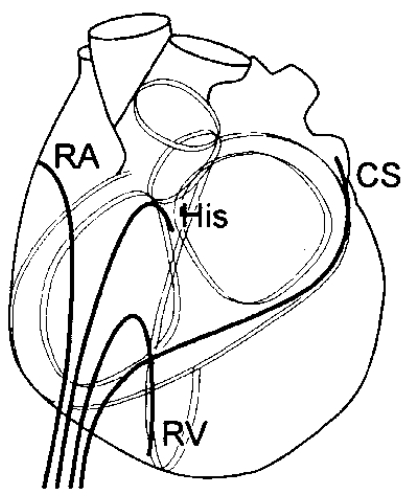
- RA pacing CL 400ms (150/min)

Ocena szlaku dodatkowego



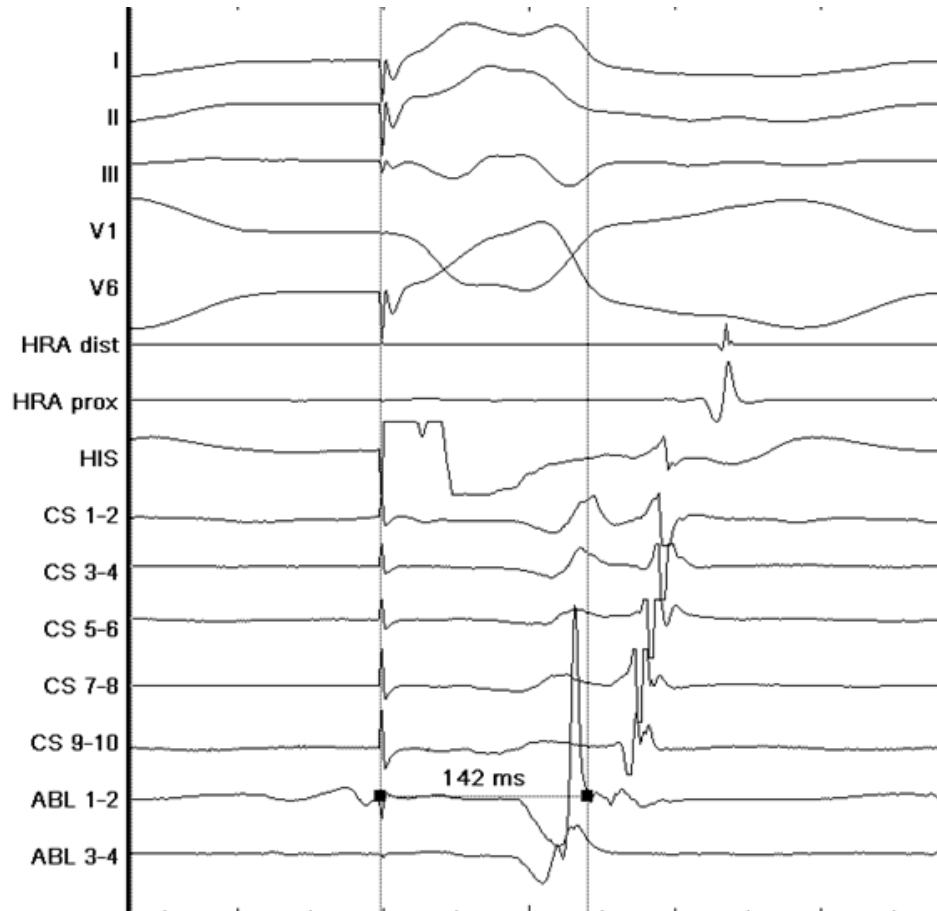
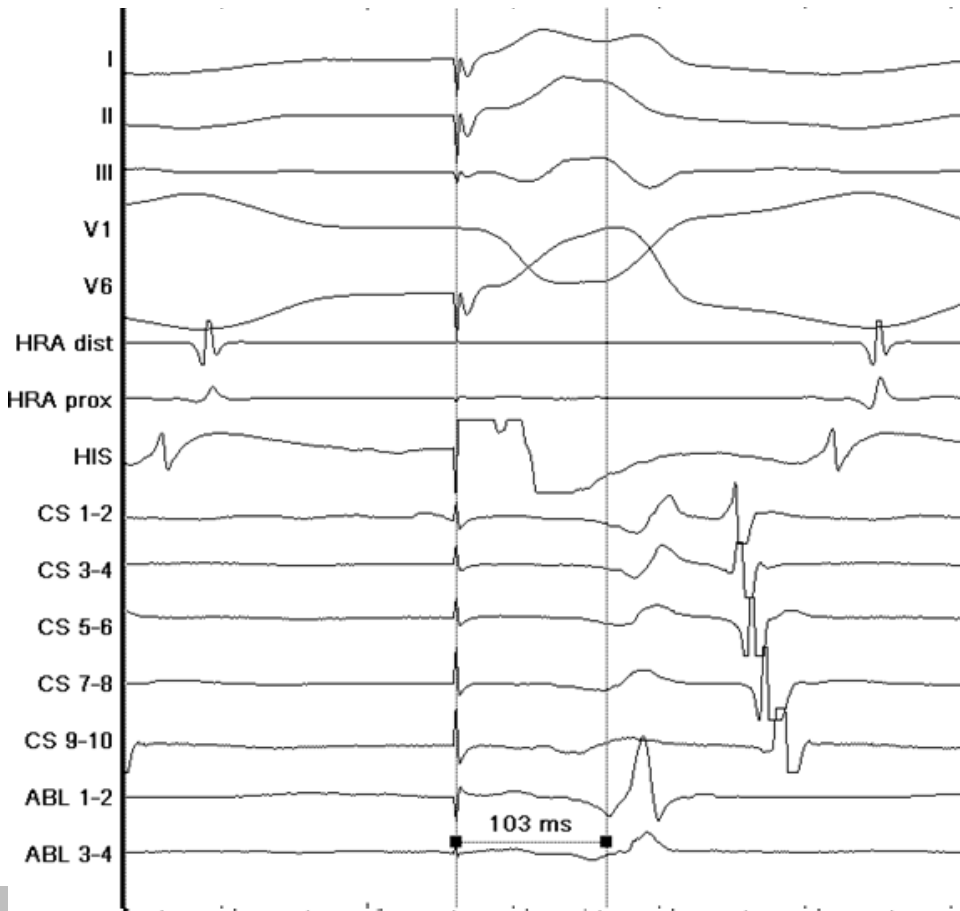
- SPERRI (*shortest pre-excited RR interval*) $< 250\text{ms}$ = high risk properties

Accessory pathway

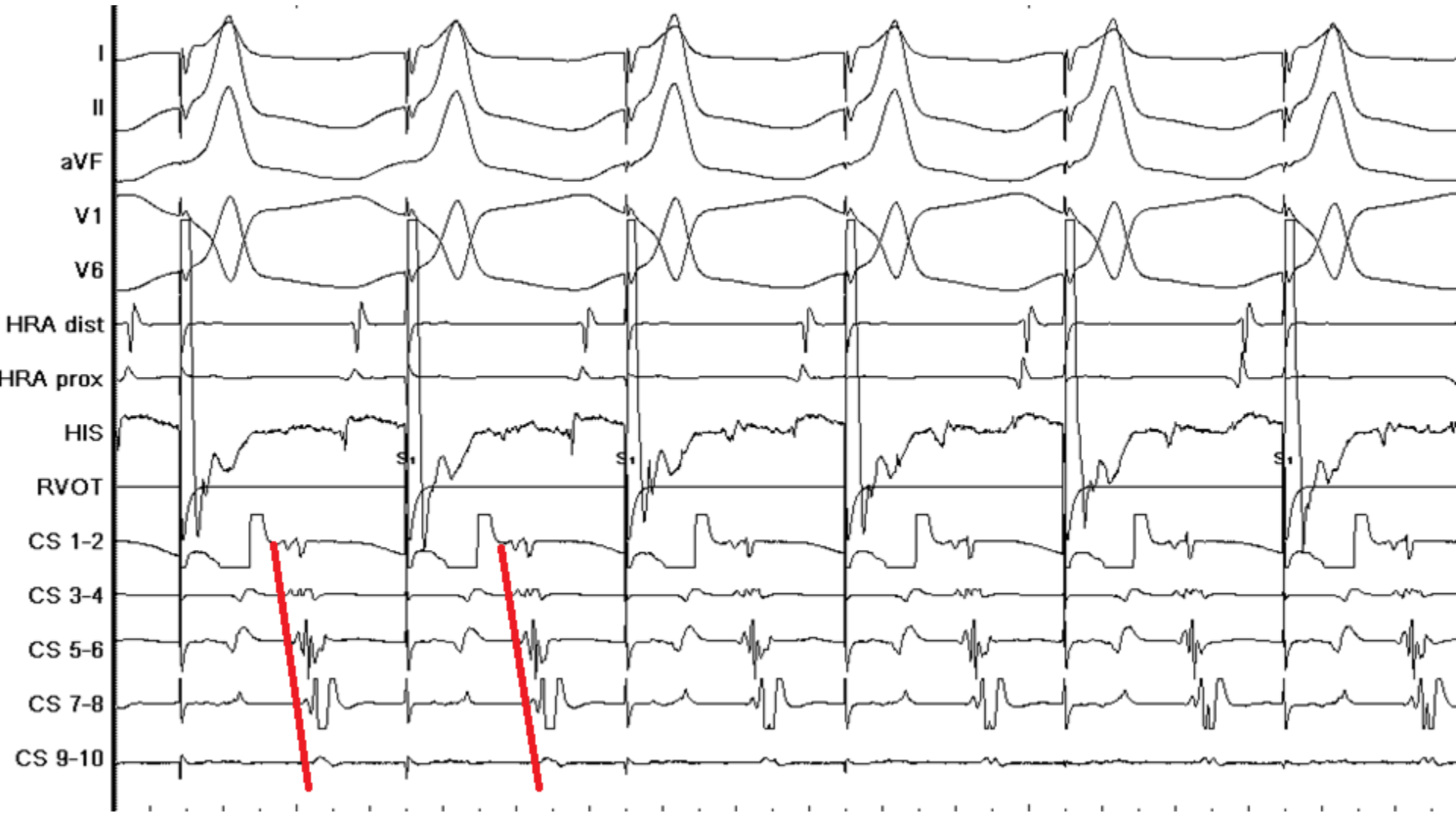


Before ablation

After ablation



Accessory pathway

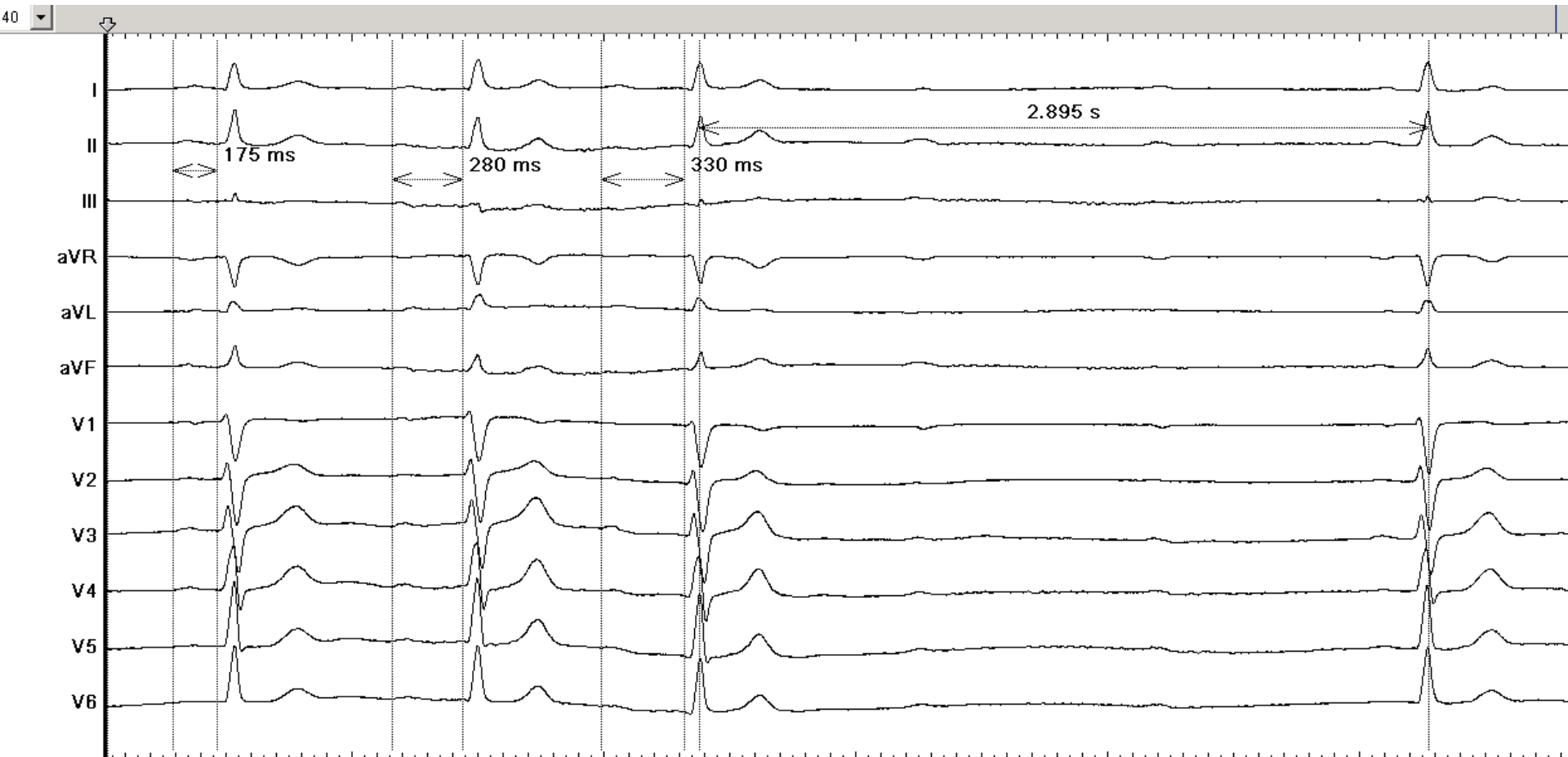


Accessory pathway



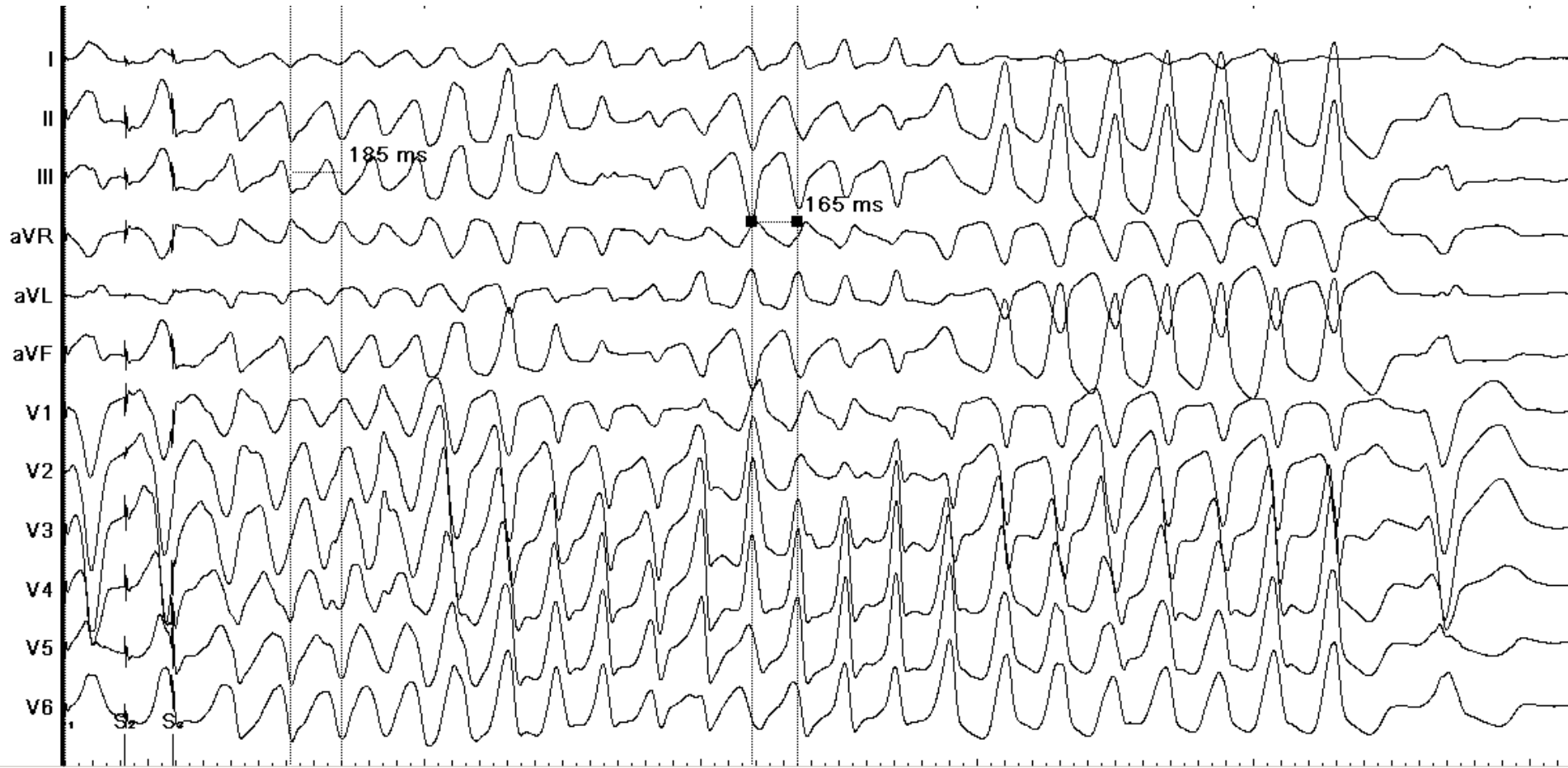
- Adenosin 12mg i.v. before ablation

Accessory pathway



- Adenosin 12mg i.v. – after ablation

Programmed stimulation- VT



EPS protocol

Baseline sinus rhythm 70/min, LBBB. Through a right femoral vein puncture, a 4-point diagnostic electrode was inserted into the HBE/RVA and a 10-point electrode into the CS. HV 58ms. CS stimulation: WP 330ms. IAP, RAP - no arrhythmia; CS programmed pacing up to 3 extra pulses - no arrhythmia. RVA pacing: WPr without retrograde conduction through atrioventricular node. IVP, RVP - without cardiac arrhythmia. RA pacing 130/30s, 130/60s, 150/30s, 150/60s cSNRT up to 320ms. Flecainid provocative test: HVmax 92ms, QRSmax 154ms..

