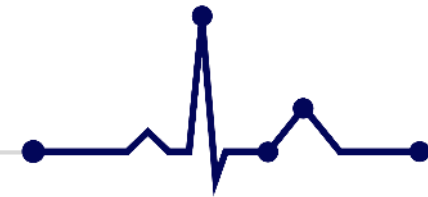




## Advances in Conduction System Pacing



**Chung, Tae-Wan**

Keimyung university Dongsan medical center, Korea

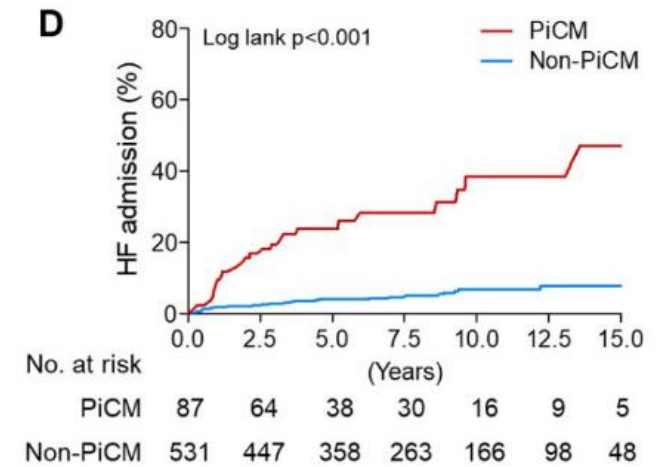
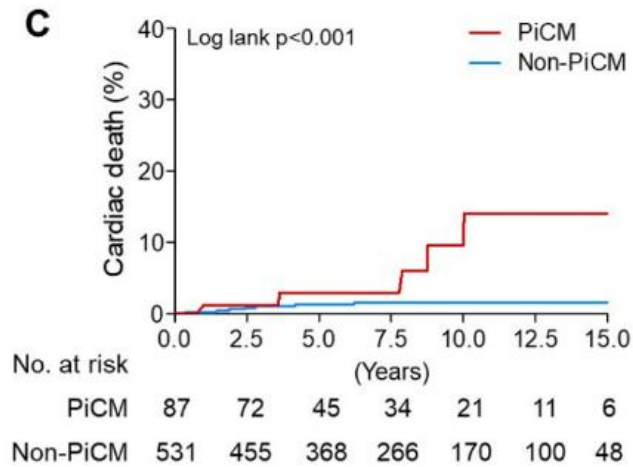
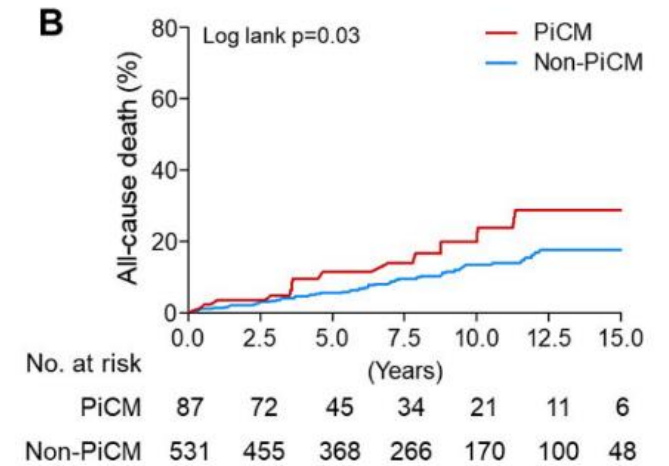
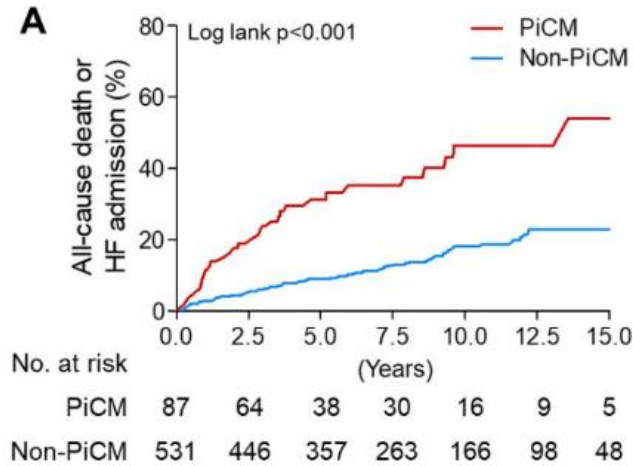
# Disclosure

## Relationships with commercial interests:

- Grants/Research Support:
- Consulting Fees:
- Other:

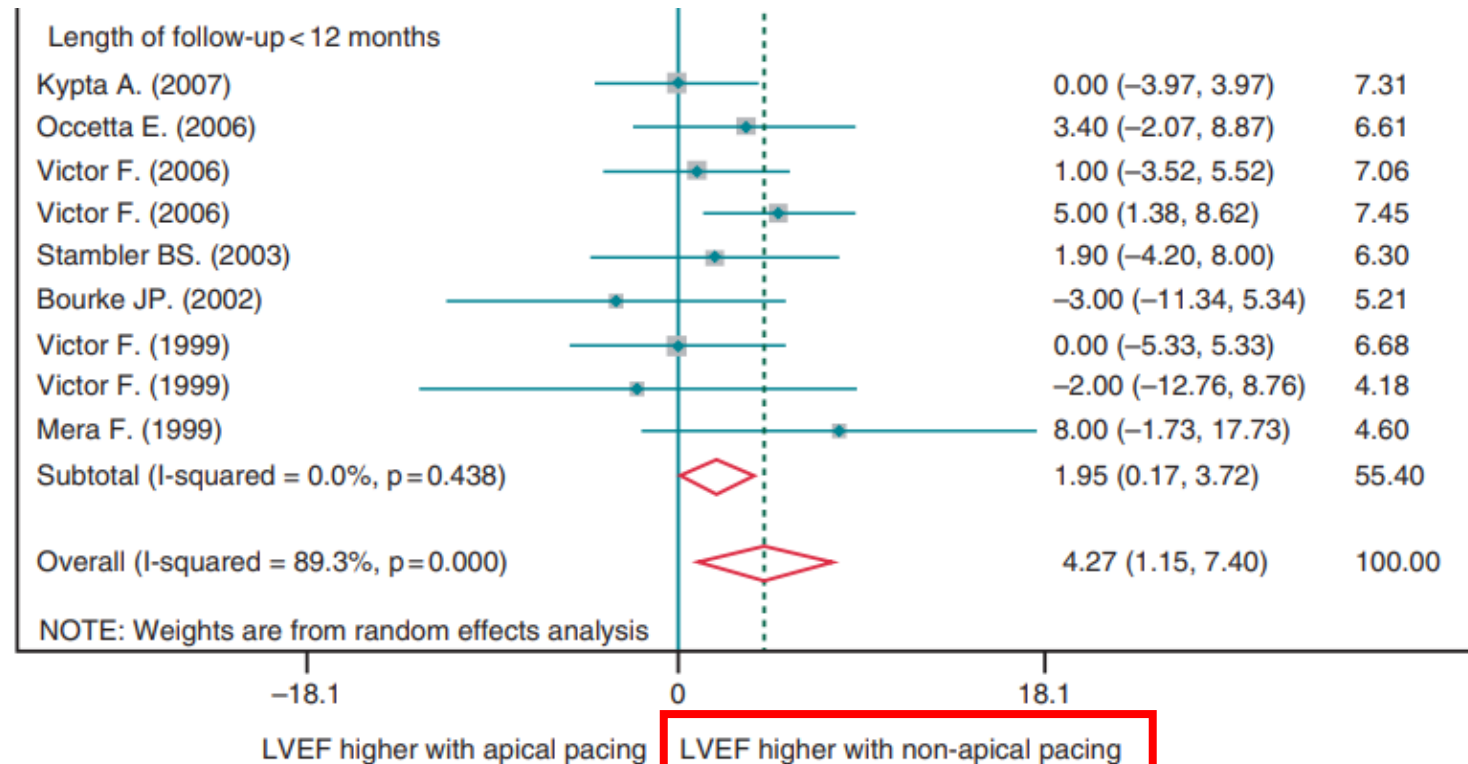


# Ventricular dyssynchrony in RV pacing

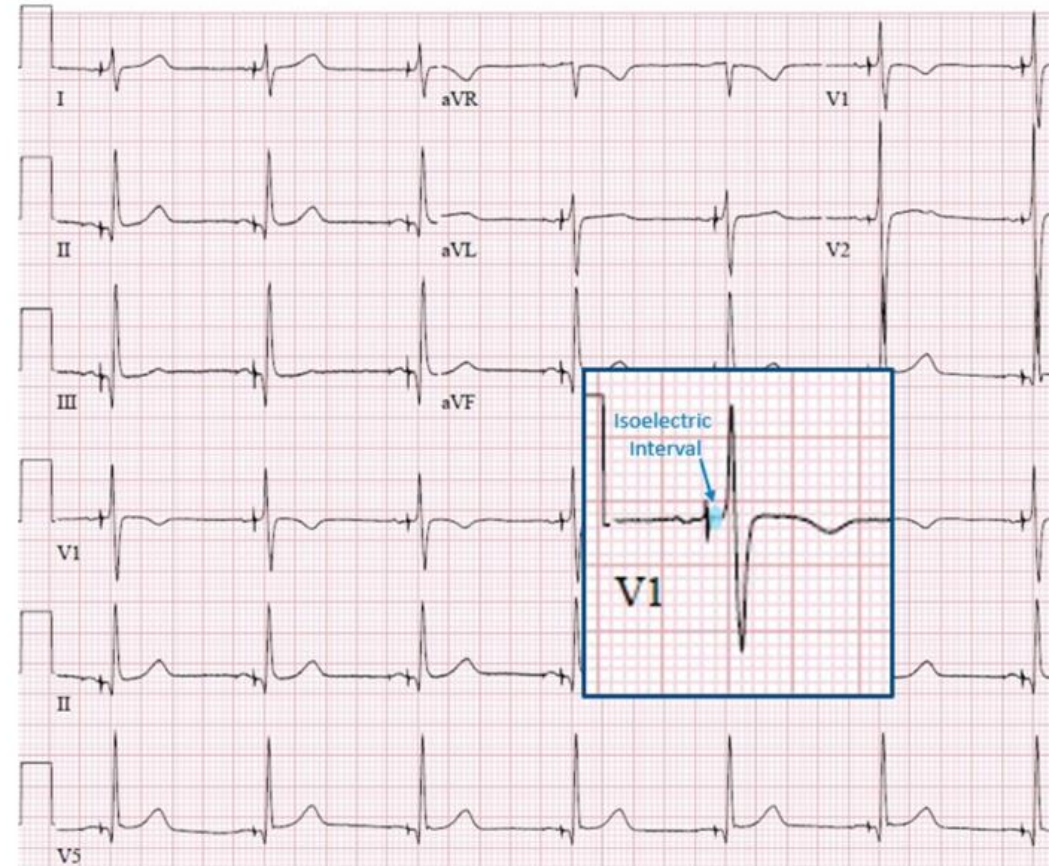
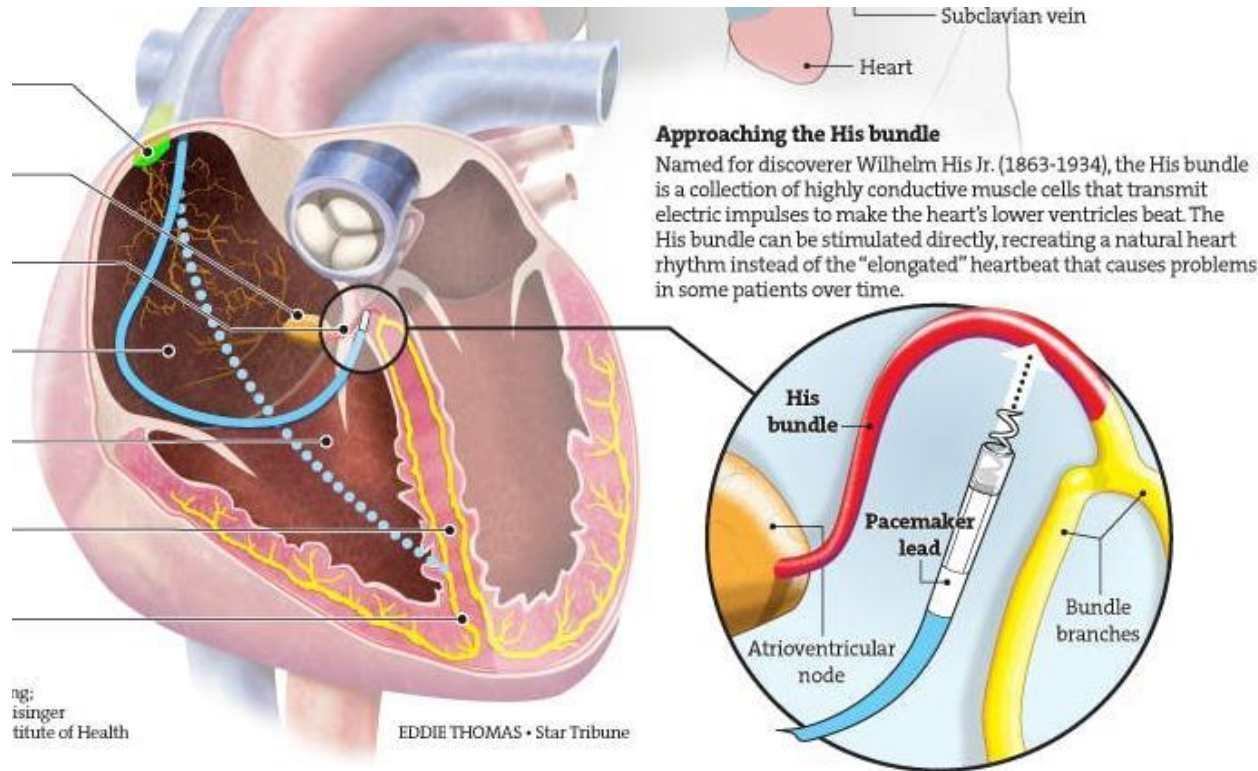


# Alternative?

## 1) Apical vs. Non-apical pacing? Better f/u LVEF in non-apical pacing... but still dyssynchrony

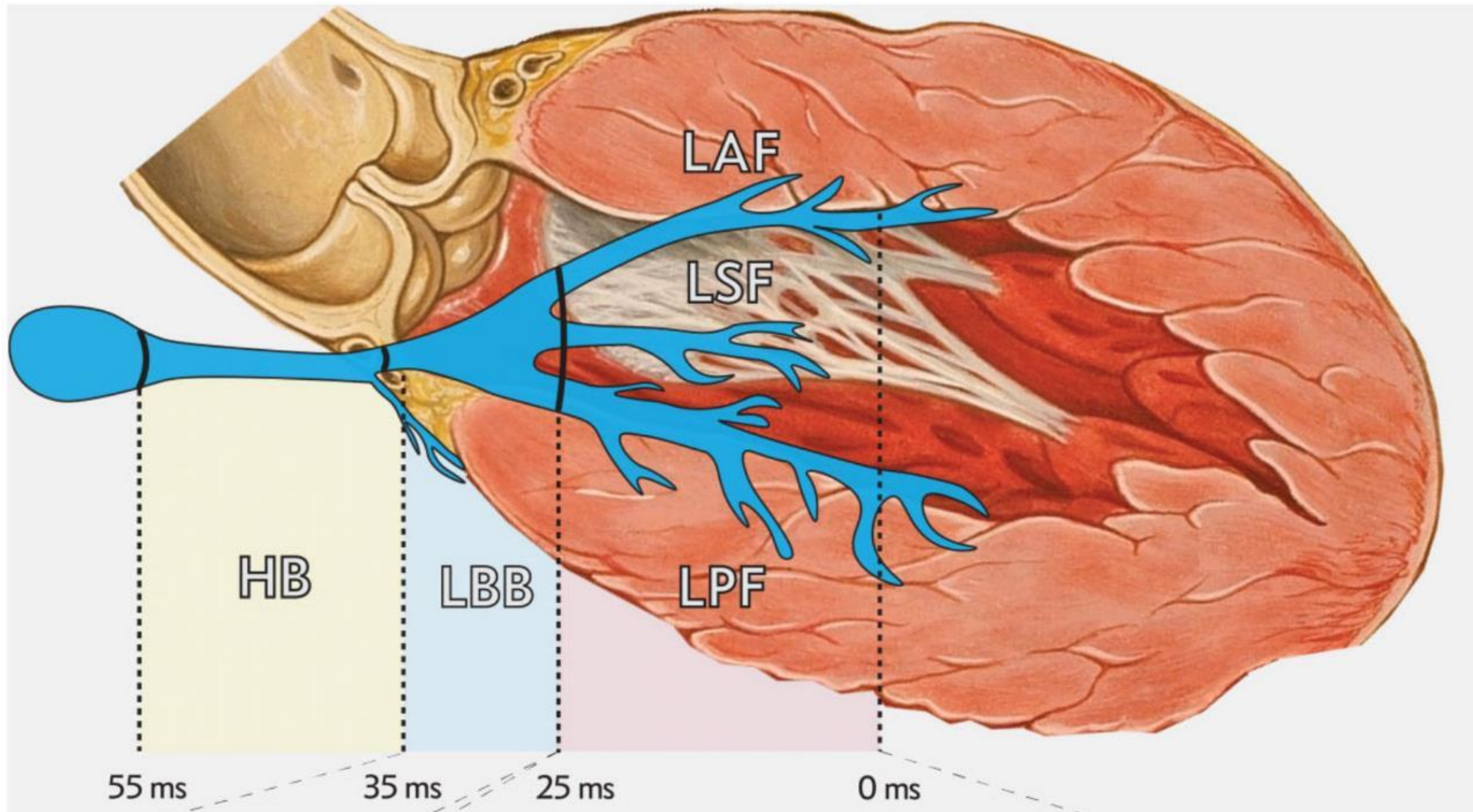


# Conduction System Pacing

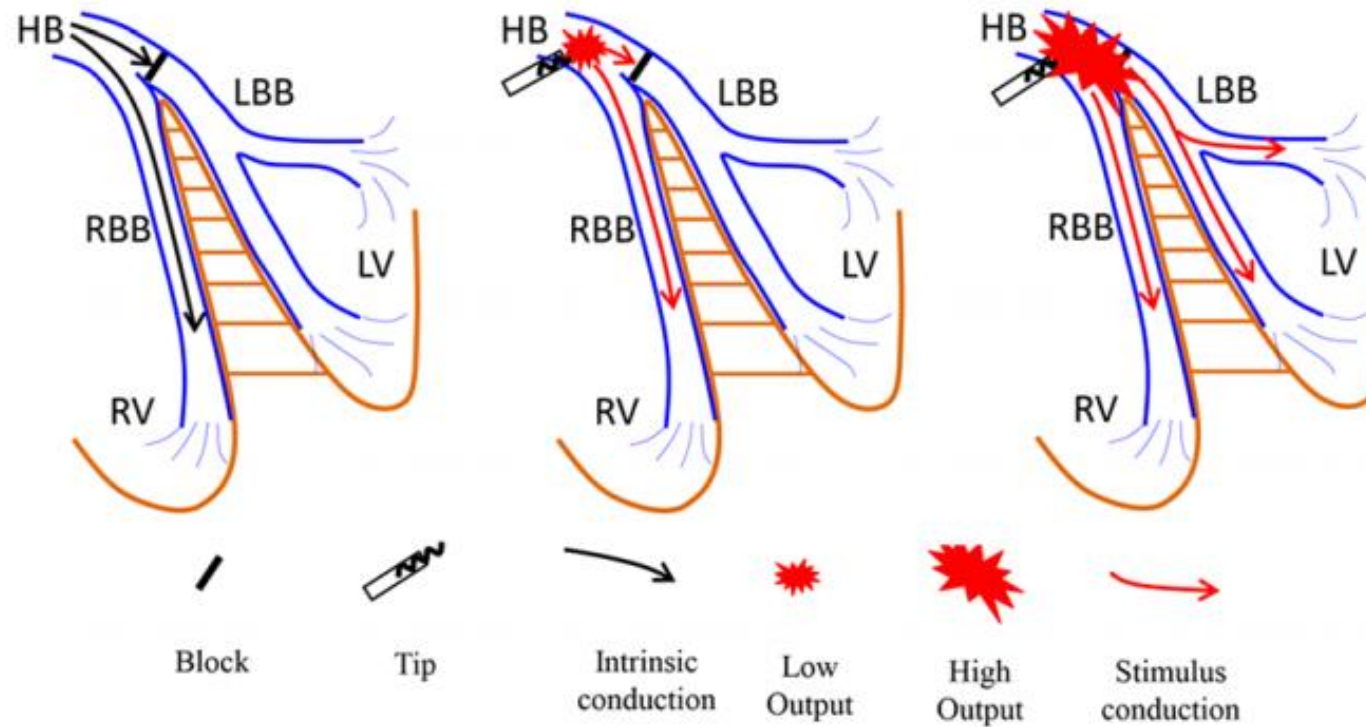


Indication? Mainly, AV block





# Limitation of His bundle pacing



**Small target area**

**High and unstable capture threshold**

**Hard to capture distal block**

**Sensing issue (A and H oversensing, V undersensing)**

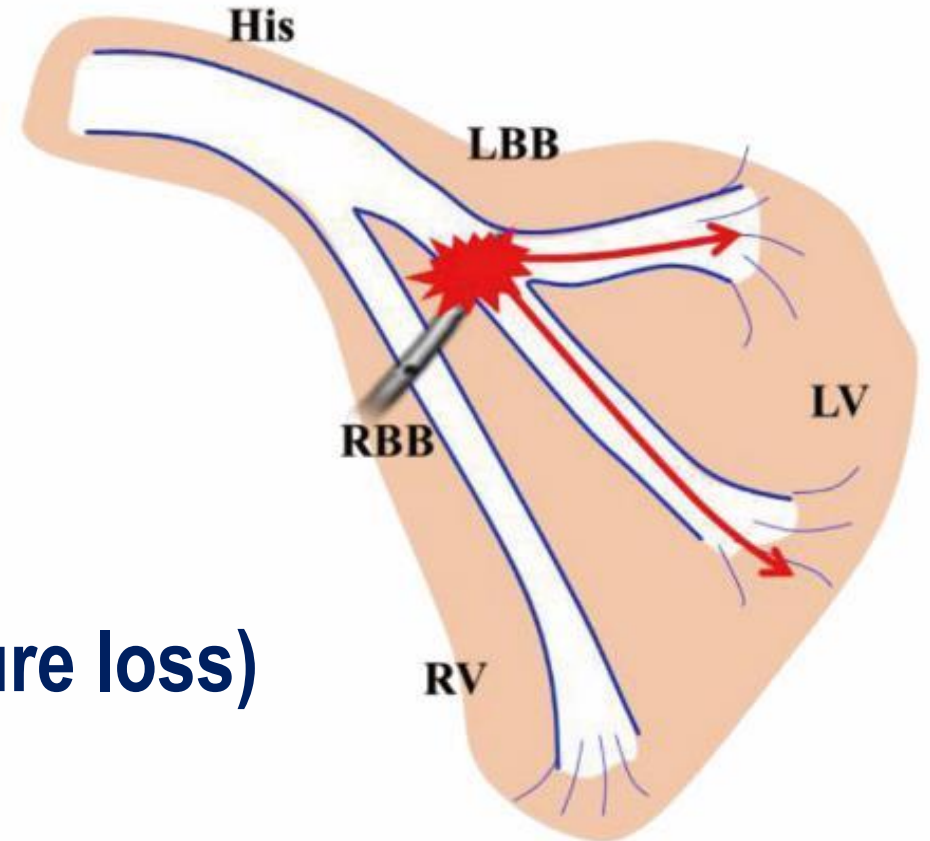
**Risk of capture failure when block progression (7%)**



# Left bundle branch area pacing

## \*\* Advantages of LBBAP over HBP

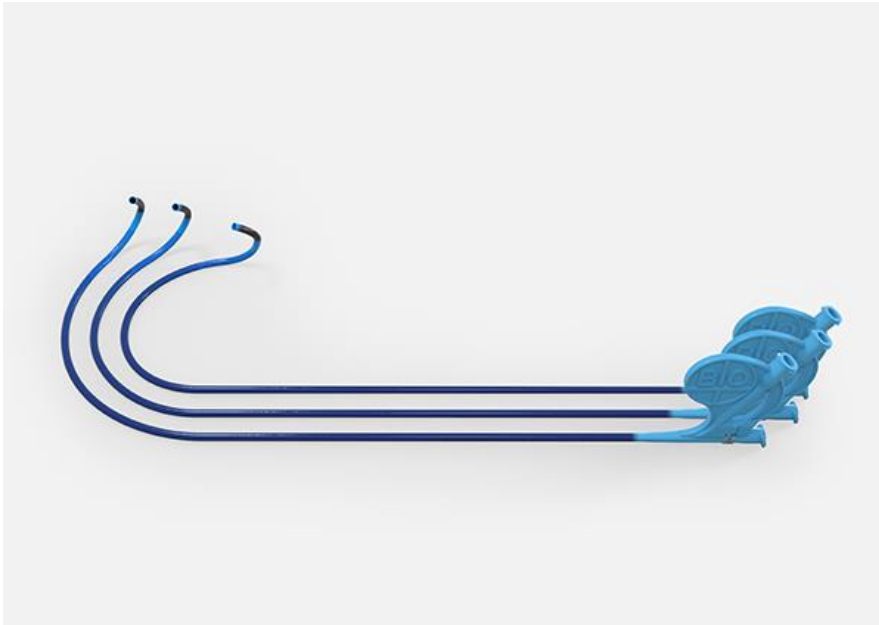
- Larger target area, high success rate
- Low and stable capture threshold
- Good sensing parameter
- Consistent myocardial capture (LBB capture loss)





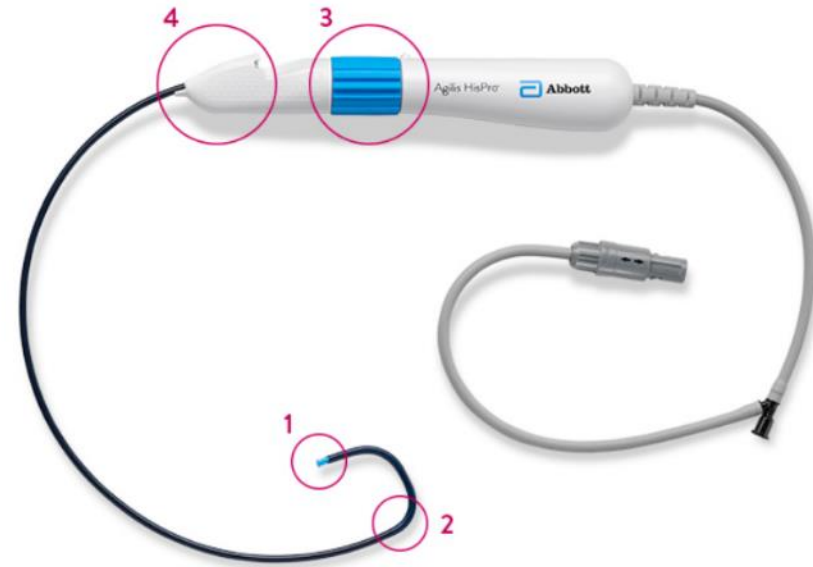
# Implantation tools

## Biotronik



3 curves: 40, 55, 65 (enlarged RA)  
2 lengths: 39, 42

## Abbott



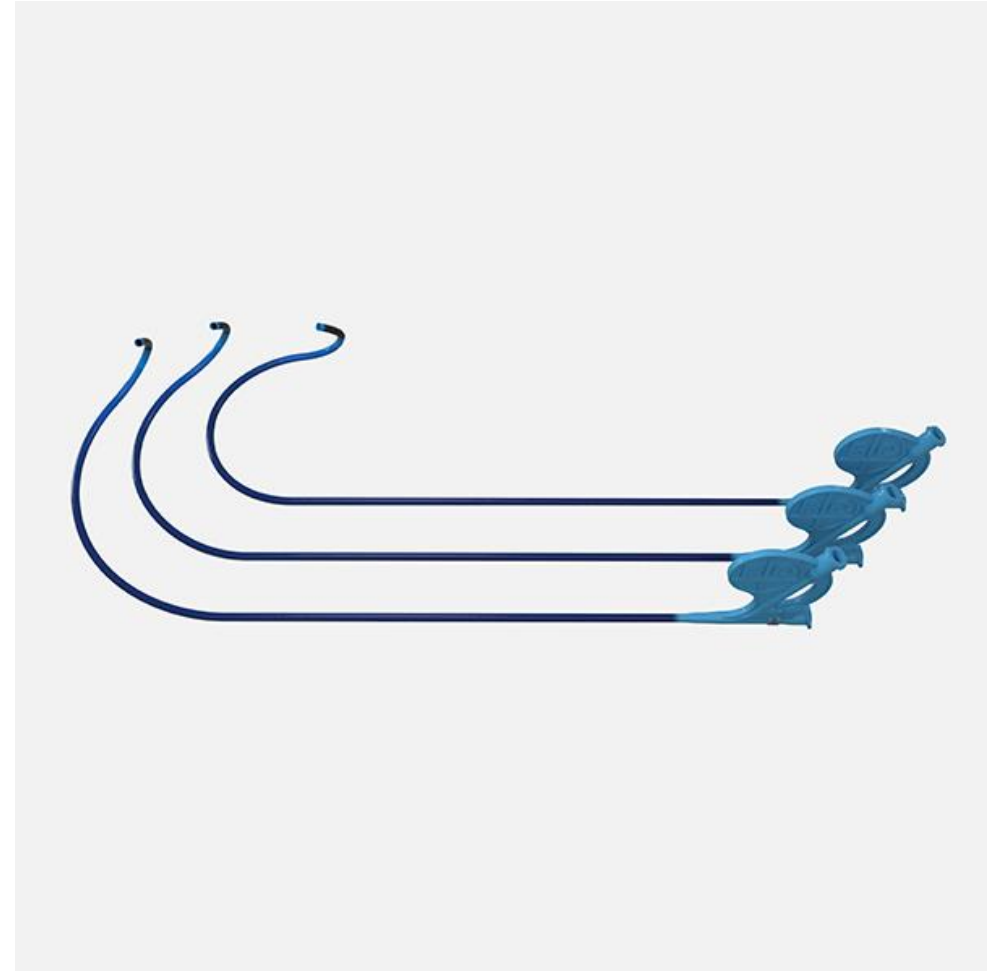
Pre-shaping  
Sheath sensing/pacing  
1 size, short length in large RA/RV



# Biotronik, Selectra 3D



**Length : 39cm/ 42cm**



**Curve : 40°/55°/65°**



## DEVICE SIZE

- Outer Diameter: 10.5F Sheath Compatible
- Inner Diameter: 7F accommodates 6F lead
- Effective Length: 38cm

## DEFLECTION, DUAL HINGE CURVE

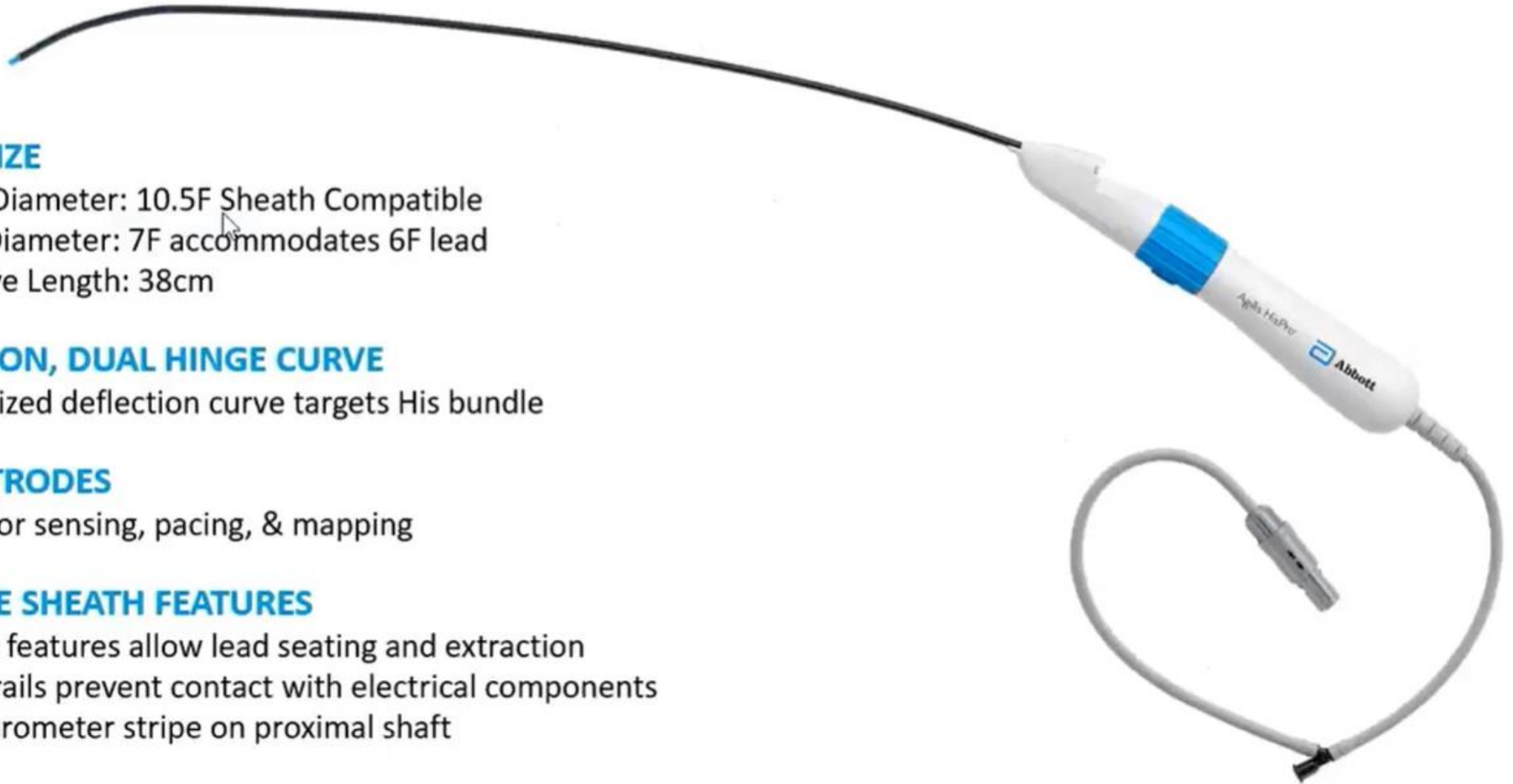
- Specialized deflection curve targets His bundle

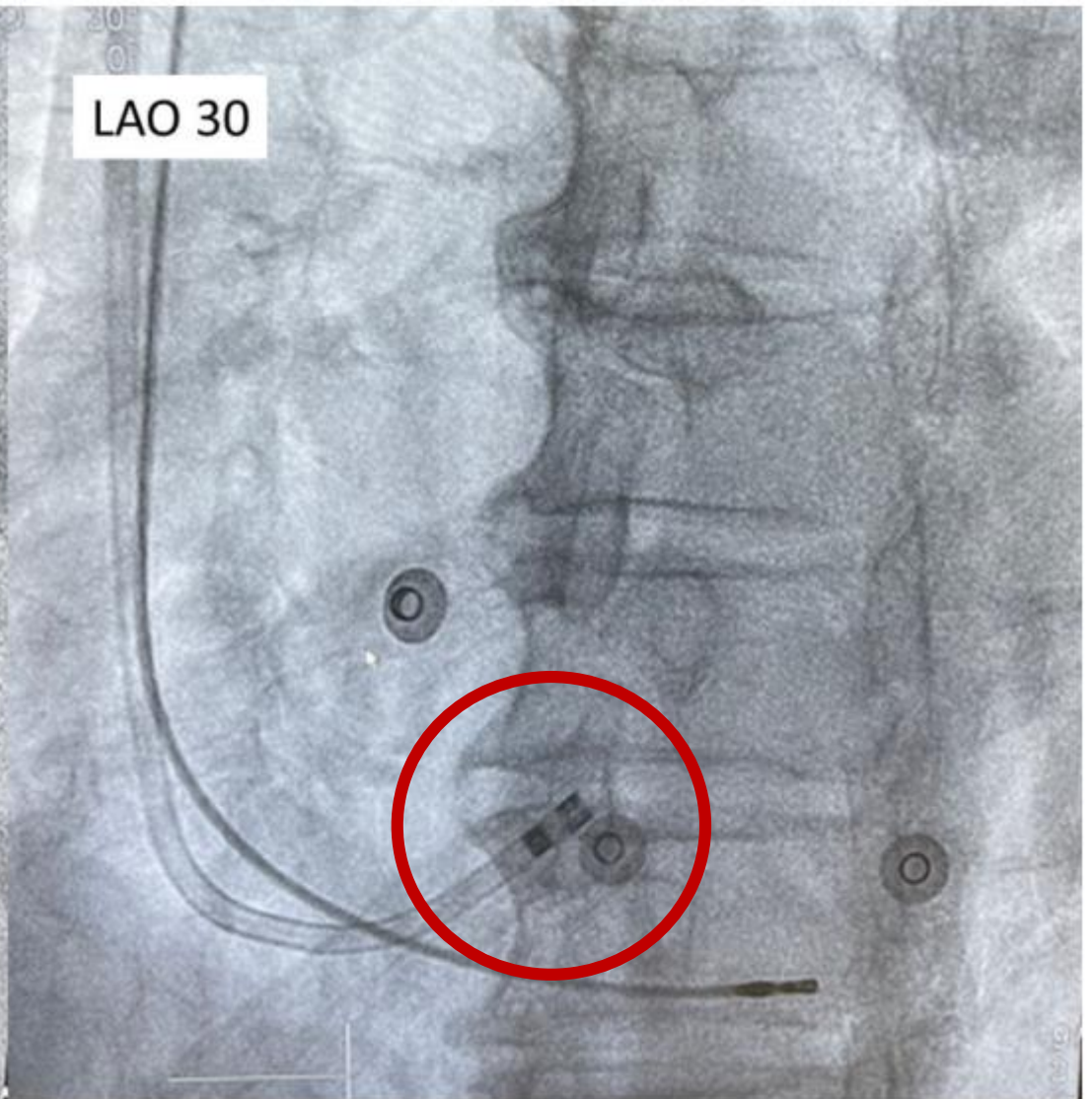
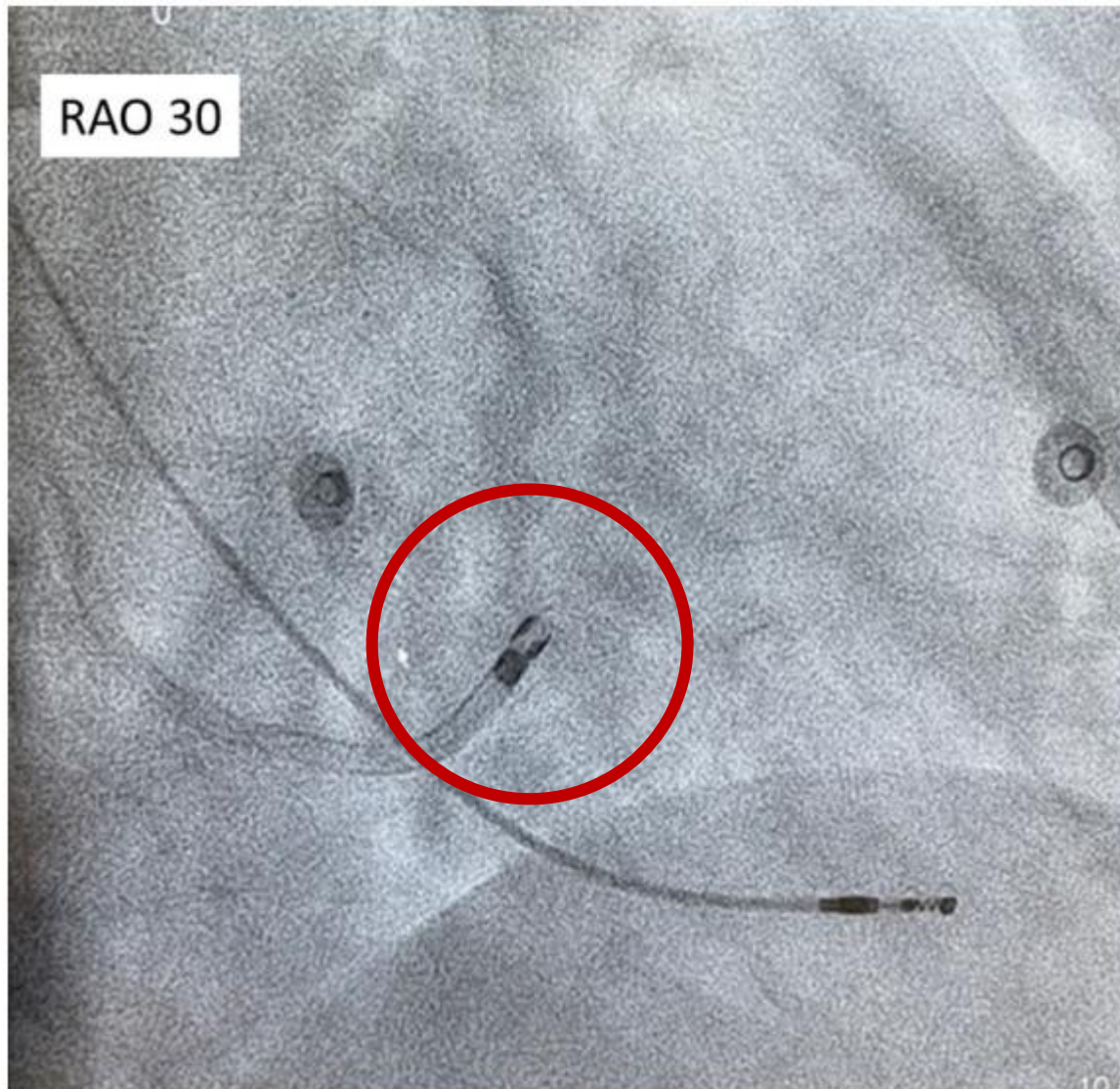
## TIP ELECTRODES

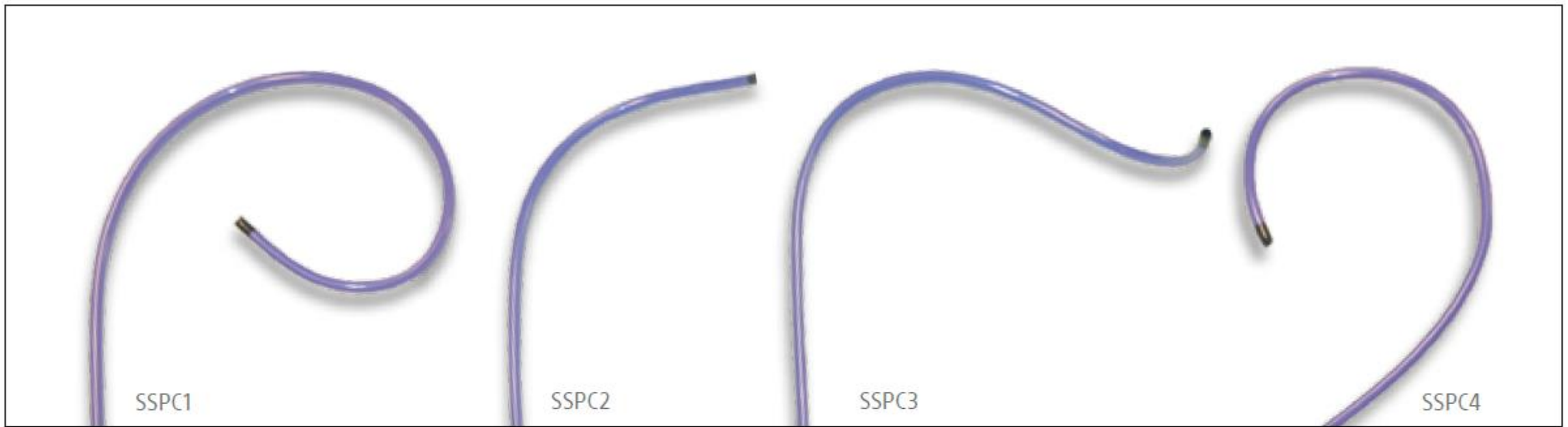
- Allow for sensing, pacing, & mapping

## SLITTABLE SHEATH FEATURES

- Handle features allow lead seating and extraction
- Guide rails prevent contact with electrical components
- Low durometer stripe on proximal shaft



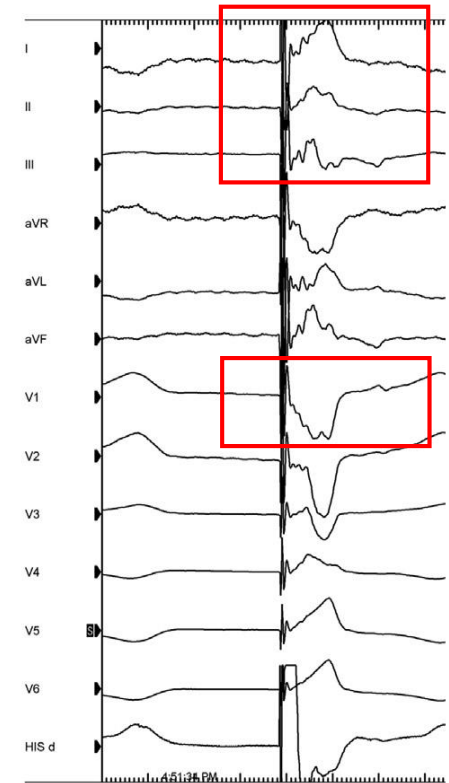
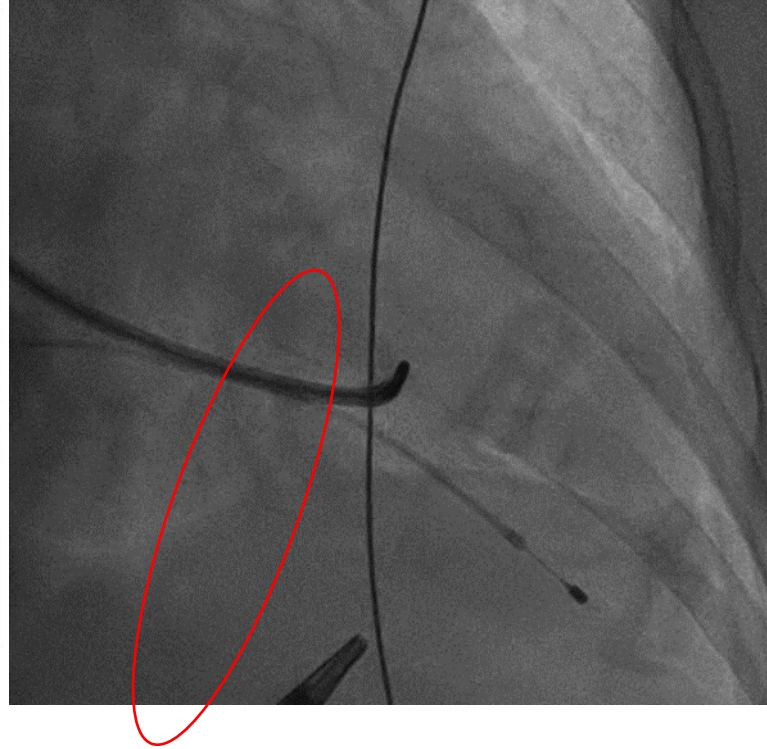
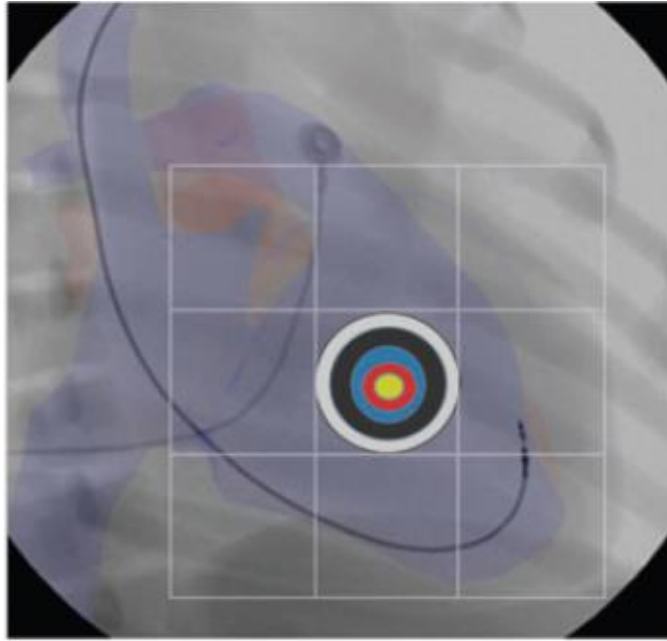




Name	Boston Scientific Model Number	Description
SSPC1	669181-200	"C-shape" designed for RA septal locations
SSPC2	669182-200	"Multipurpose" designed for RA and RV septal locations
SSPC3	669183-200	"Extended hook" designed for dilated RA and RV septal locations
SSPC4	669184-200	"Right sided" designed for right sided venous access to RA septal locations



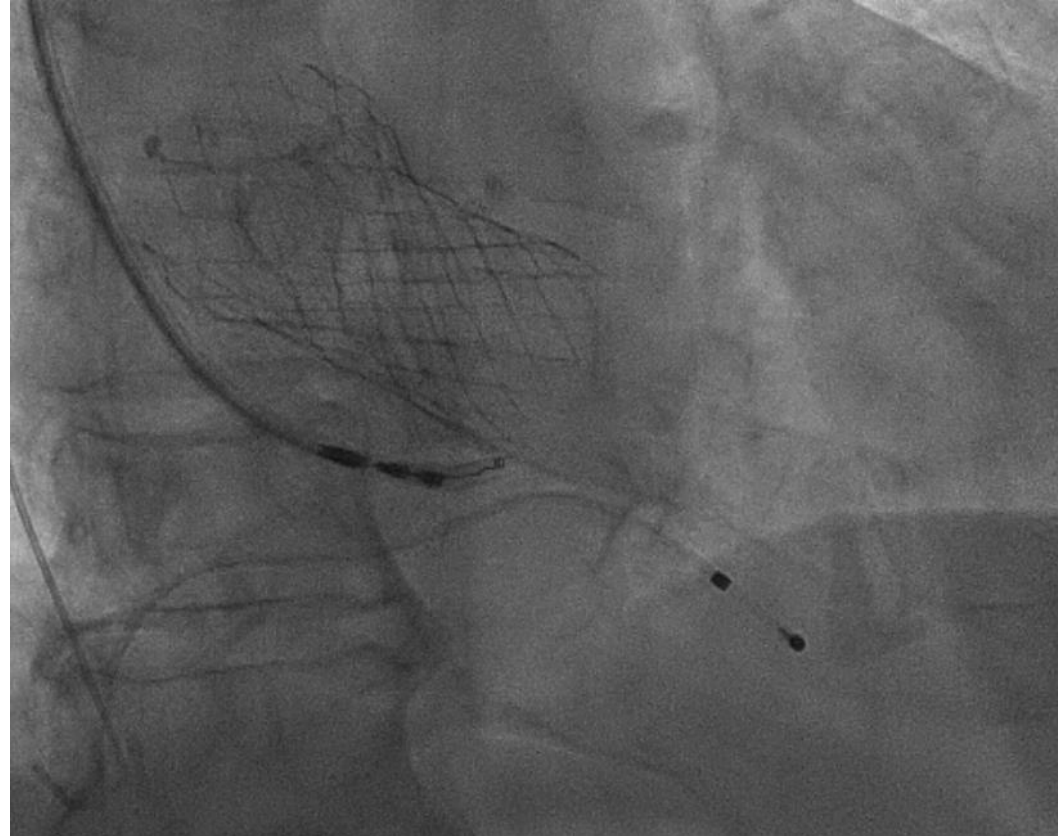
# Initial site for LBBAP



**Sheath to RVOT using Hydrophilic wire (Terumo)**  
**Pullback with CCW rotation**  
**Septal side check with Terumo wire**  
**Perpendicular to IVS (LAO)**



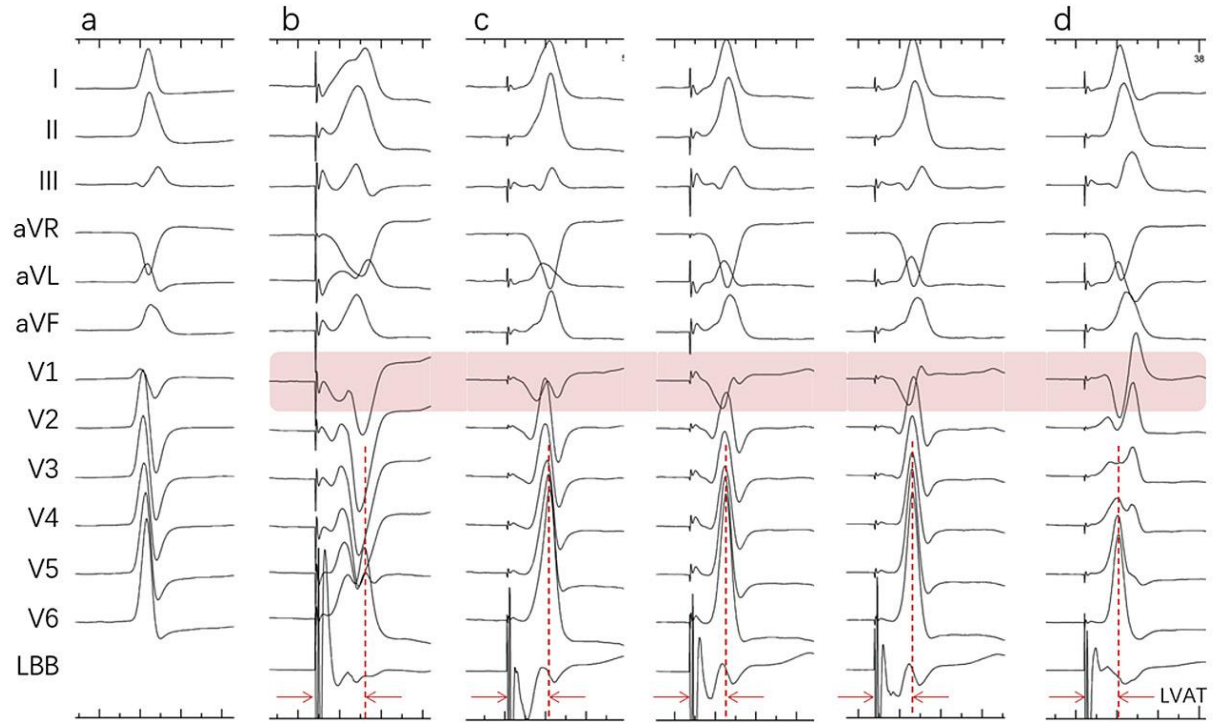
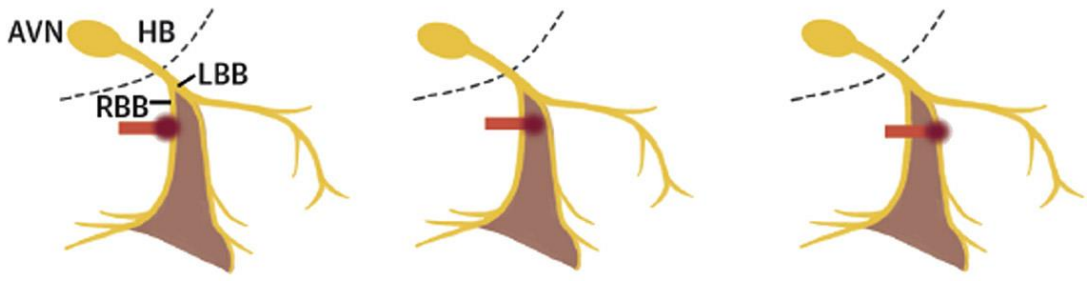
# Initial site for LBBAP



**Too basal septum is not recommended (fibrous skeletal ring, TV apparatus)  
No smooth advance of V lead during rotation, consider change position**



# Fixation of lead into the septum



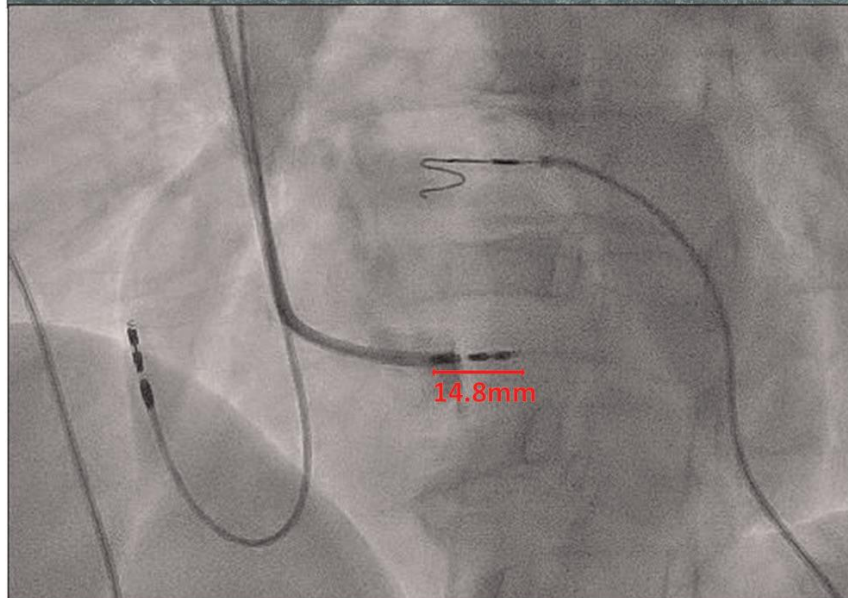
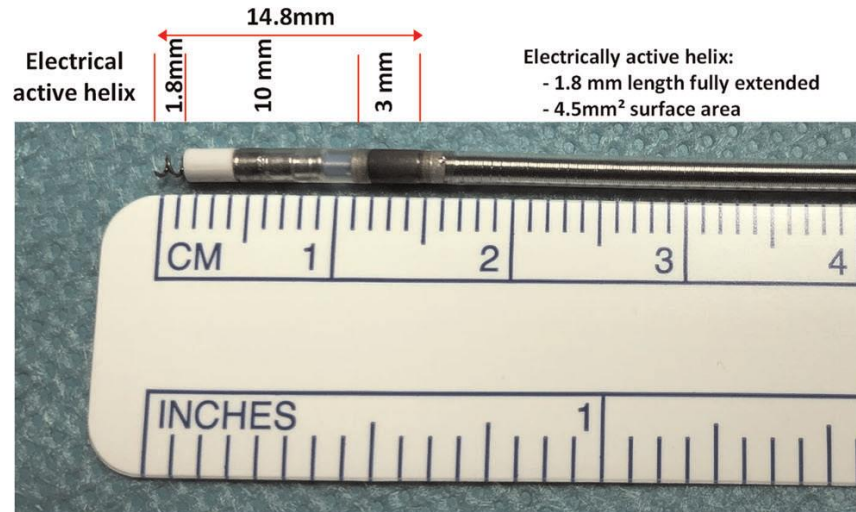
**V1 R wave**  
**Lead II / III**  
**LVAT in V5-6 < 80ms**  
**V6-V1 peak to peak > 33ms**  
**Impedance > 450-500ohm**  
**LBB potential**



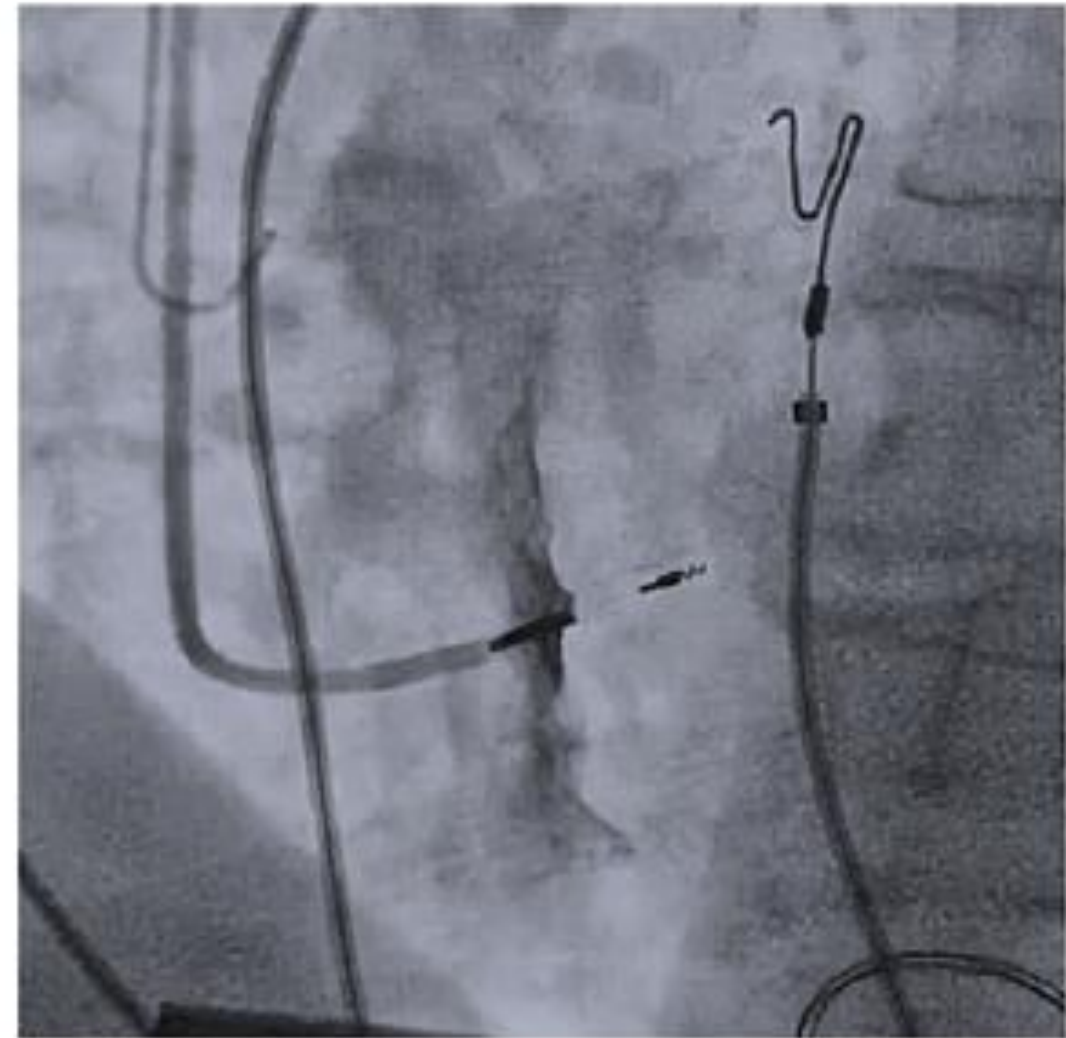


# Fixation of lead into the septum

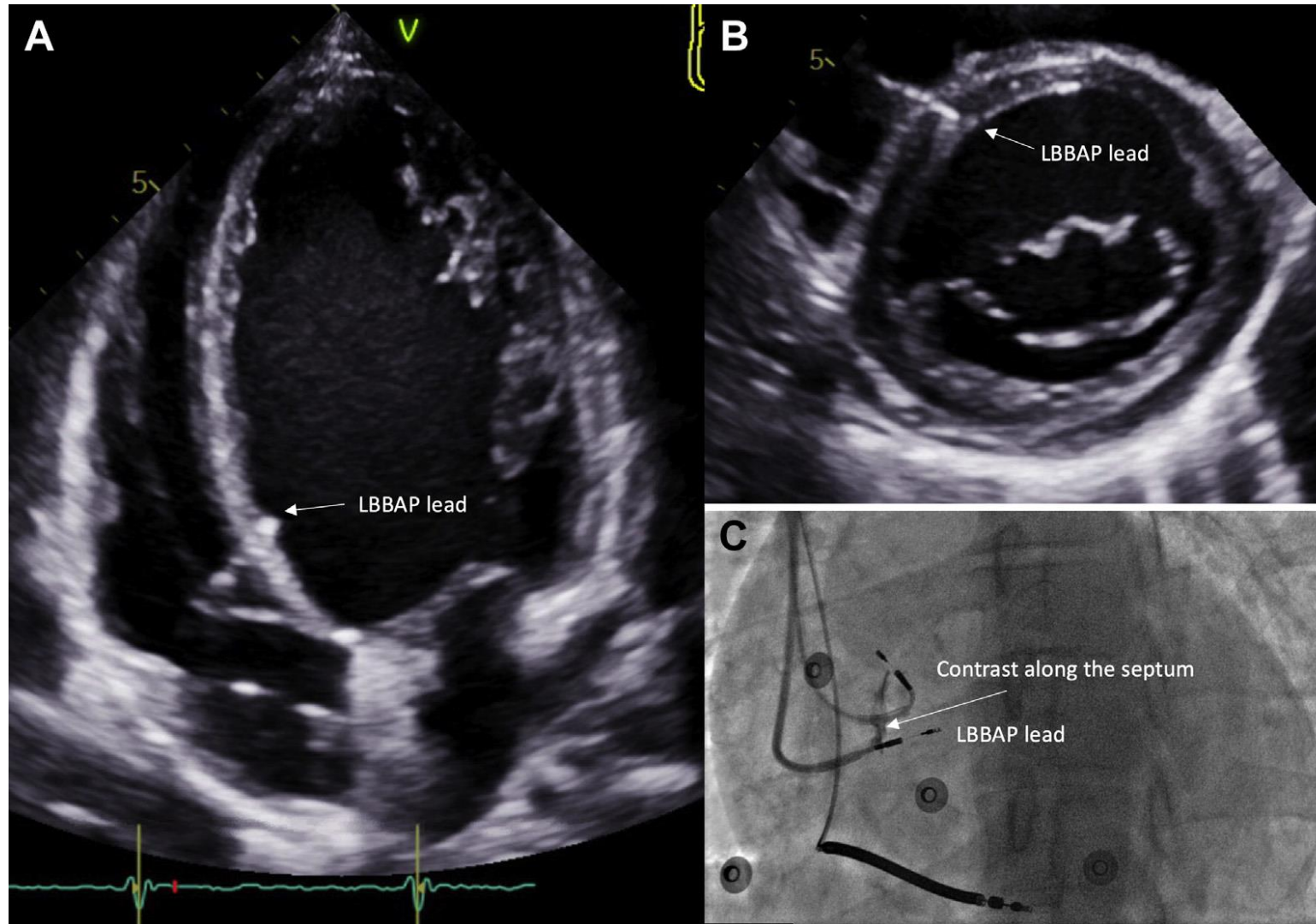
## Stylet-driven, extendable helix lead<sup>(5.6Fr)</sup>



Biotronik Solia S lead



# Lead position in Echocardiography

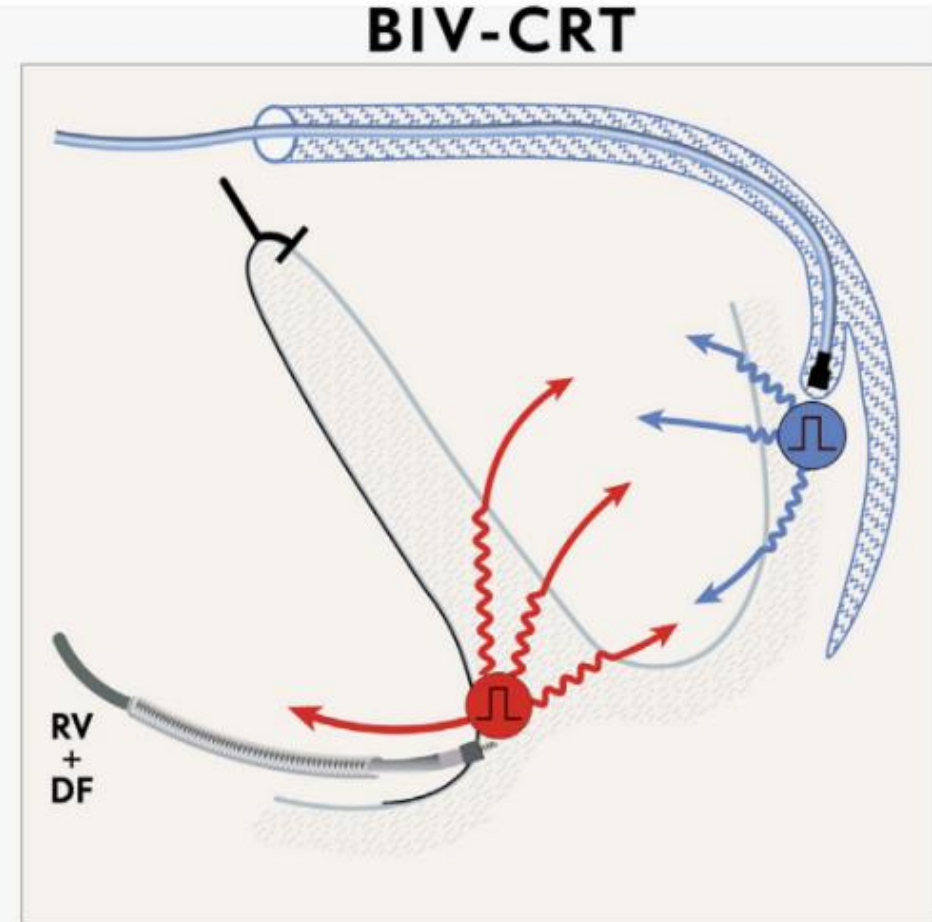
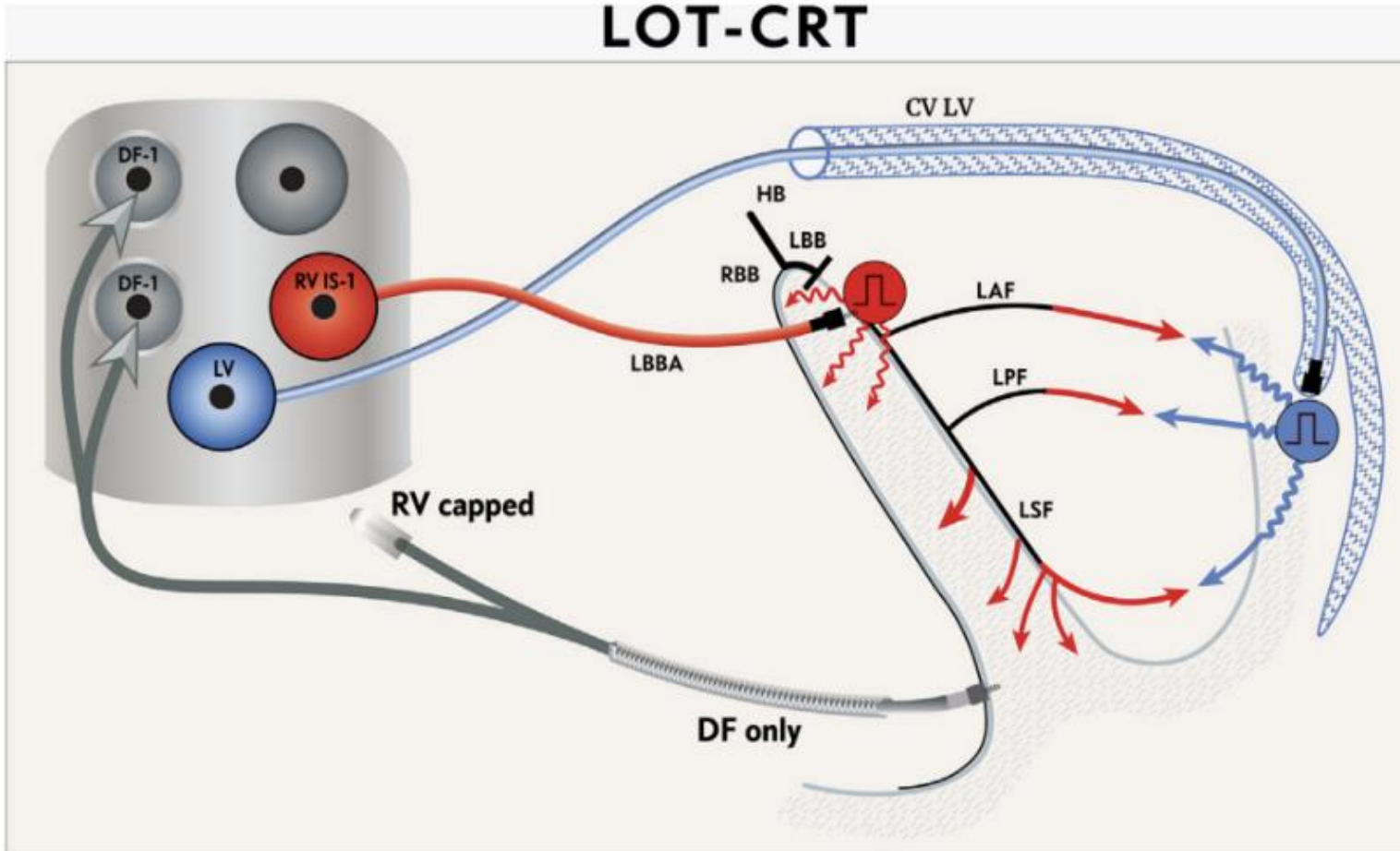


# LBBAP ??

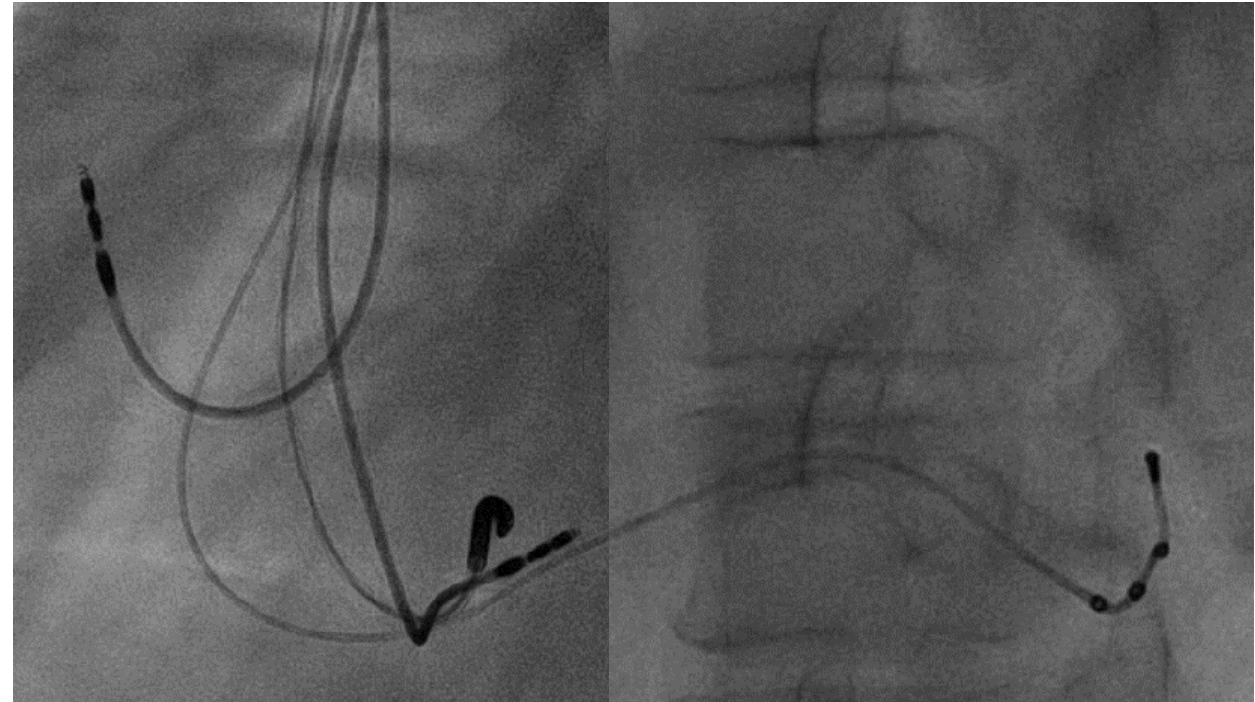
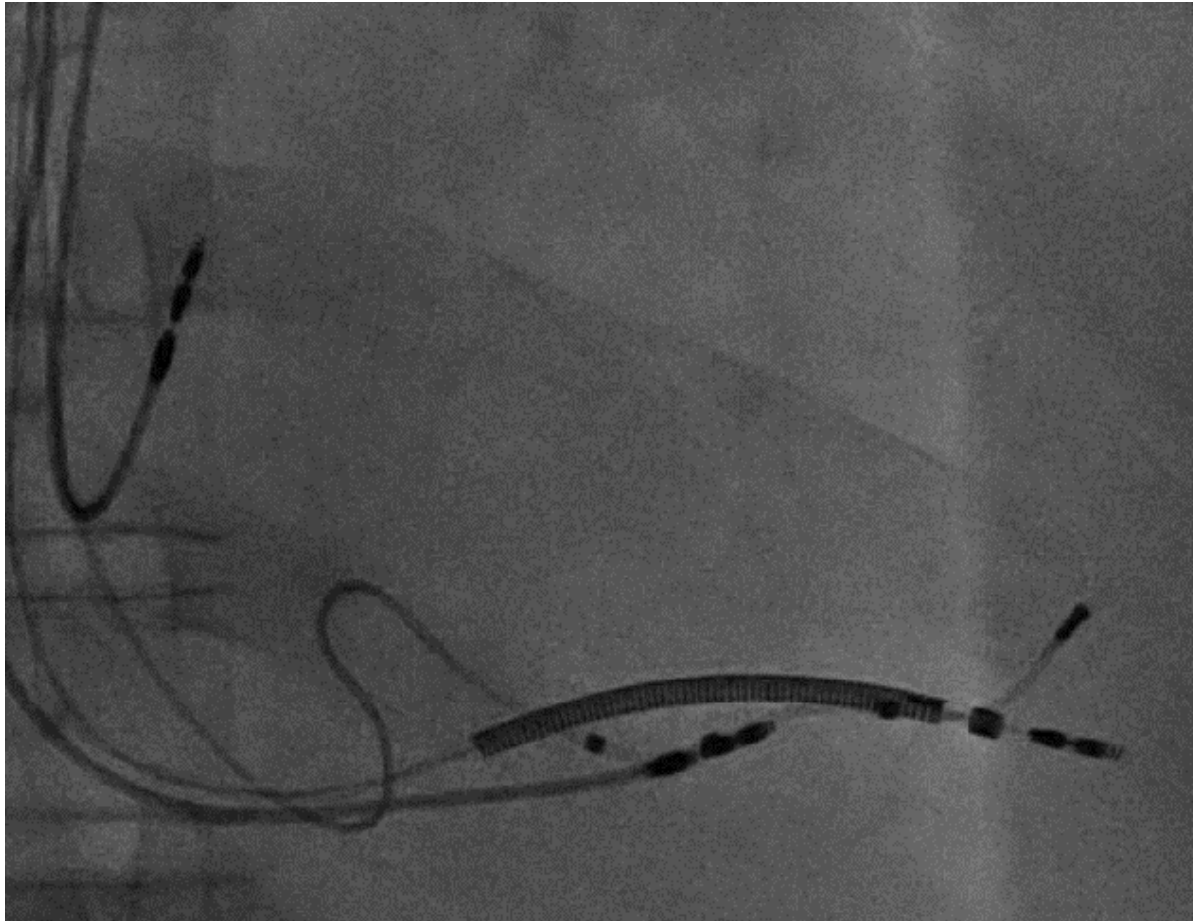
- (1) Diagnostic QRS morphology transition during threshold test.<sup>3,11</sup>
- (2) Diagnostic QRS morphology transition during programmed stimulation.<sup>14</sup>
- (3) Pacing stimulus to  $V_6$ RWPT  $<80$  ms in patients with narrow QRS/ isolated right bundle branch block patients or  $<90$  ms in patients with more advanced ventricular conduction system disease.<sup>3,15</sup>
- (4) LBB potential to  $V_6$ RWPT interval equal to the stimulus to  $V_6$ RWPT interval ( $\pm 10$  ms).<sup>3</sup>
- (5)  $V_6$ - $V_1$  interpeak interval  $>40$  ms.<sup>13</sup>



# Left bundle branch pacing optimized CRT (LOT-CRT)



# Left bundle branch pacing optimized CRT (LOT-CRT)



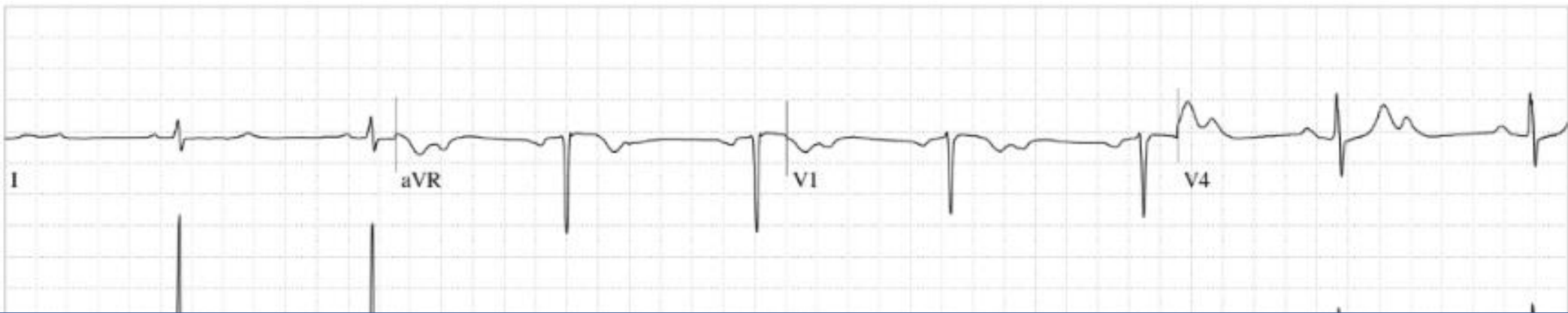
# Case



# Case information

64/ Female

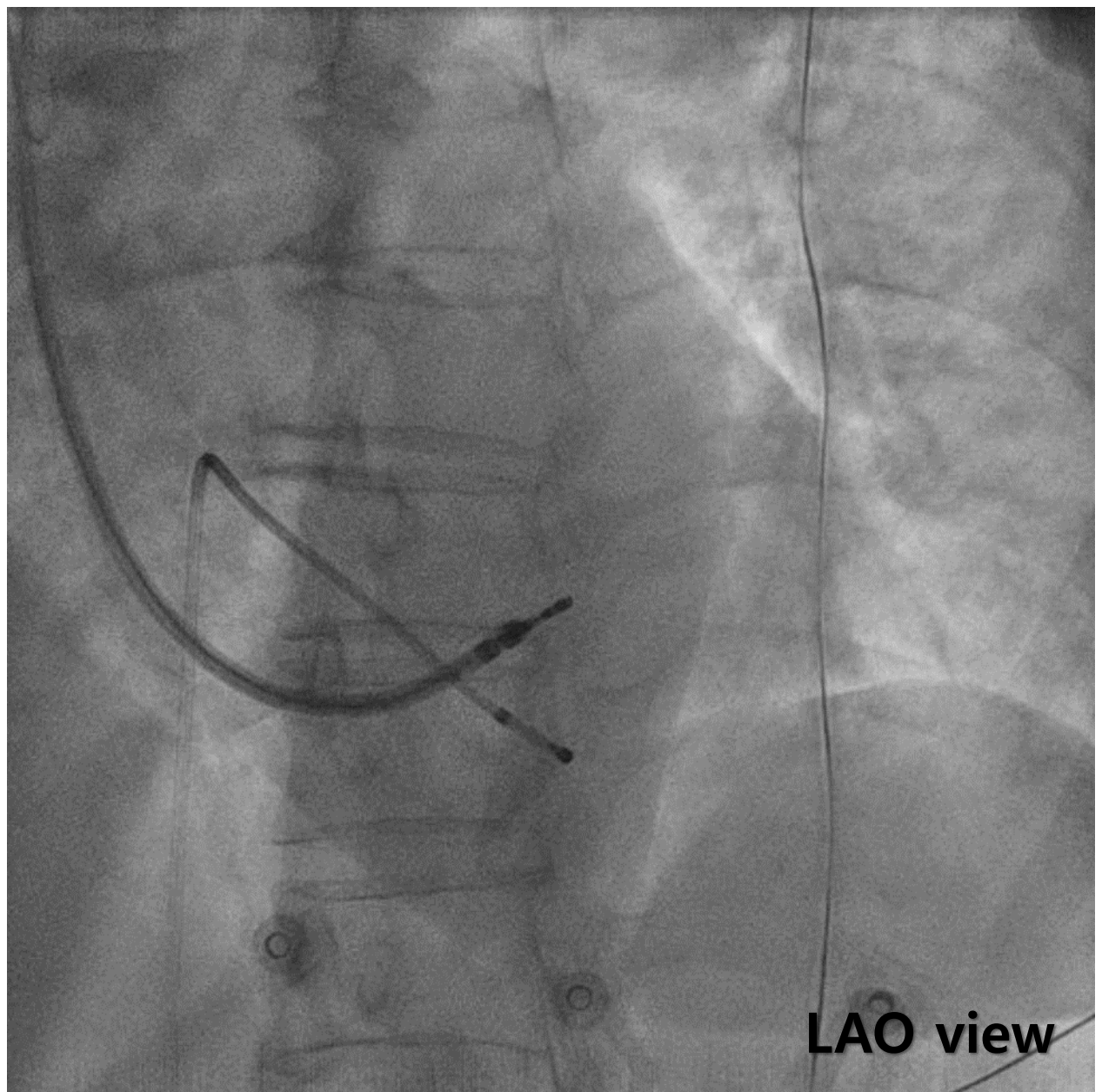
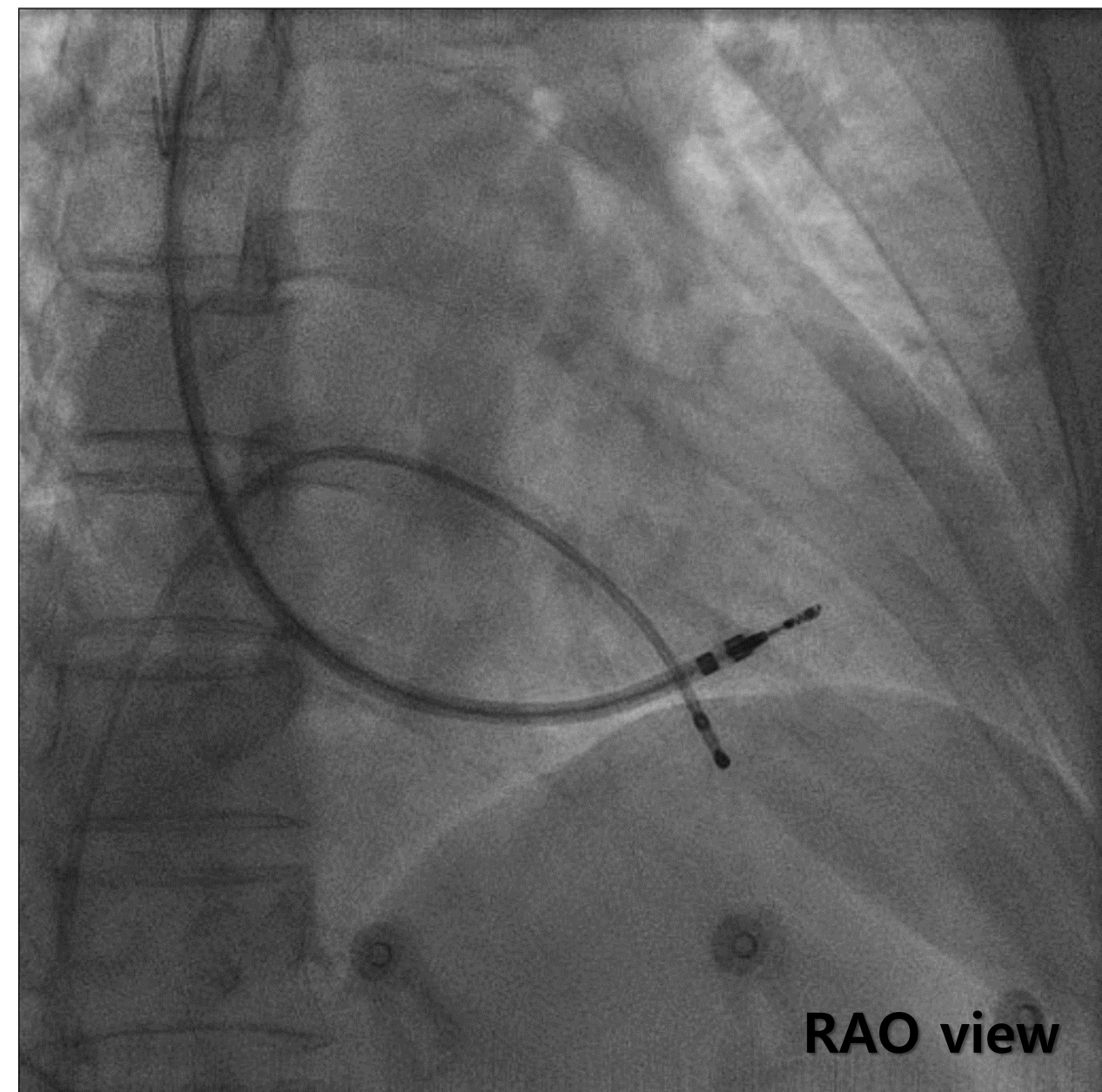
- ER visit for dizziness
  - **High degree AV block (2:1) : admission**
- Known DM on insulin, hypertension
- Known peri-membranous type of VSD (8YA)
- AKI with hyperkalemia
  - Improved
  - **Intermittent high degree AV block (2:1)**

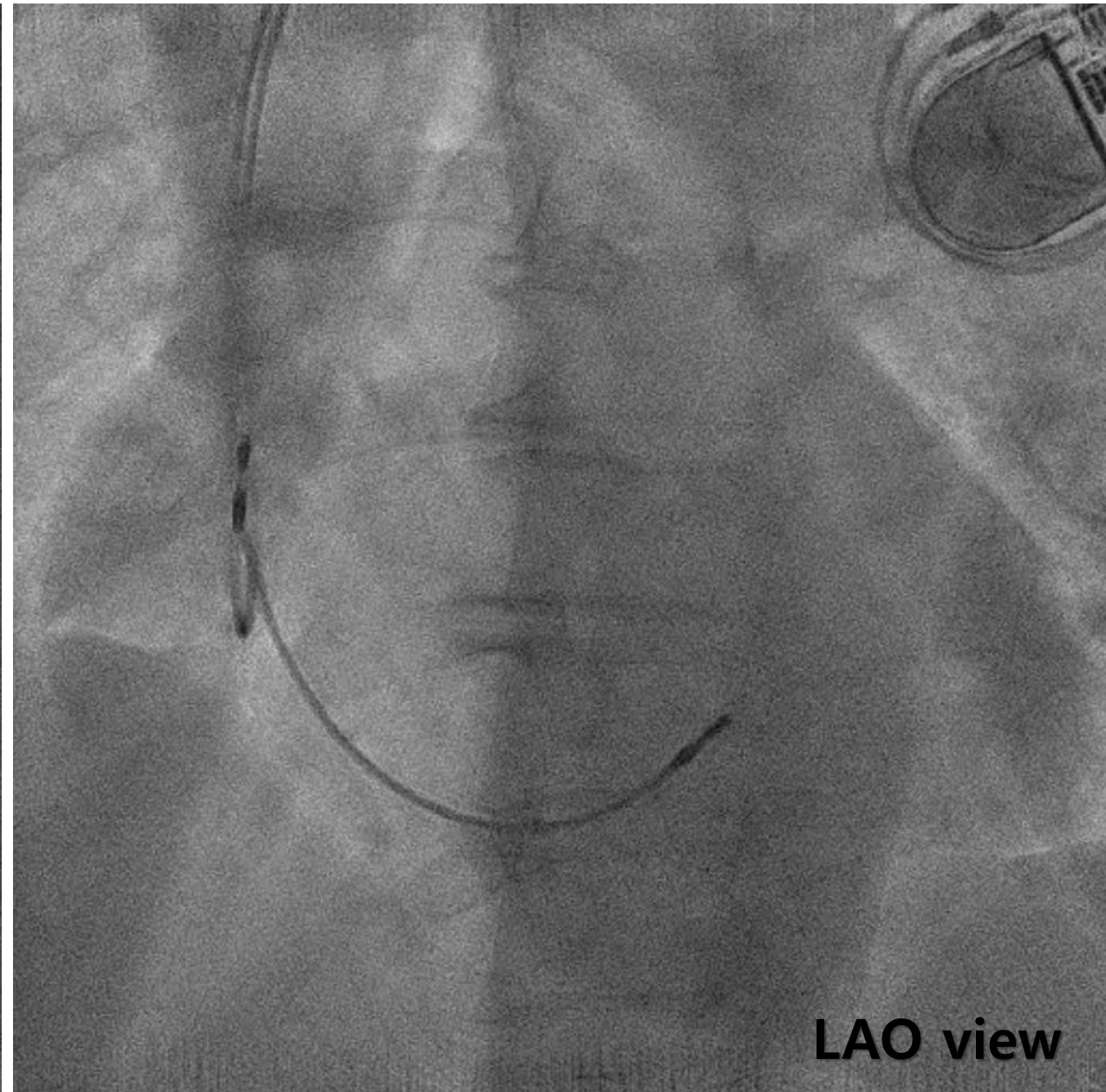
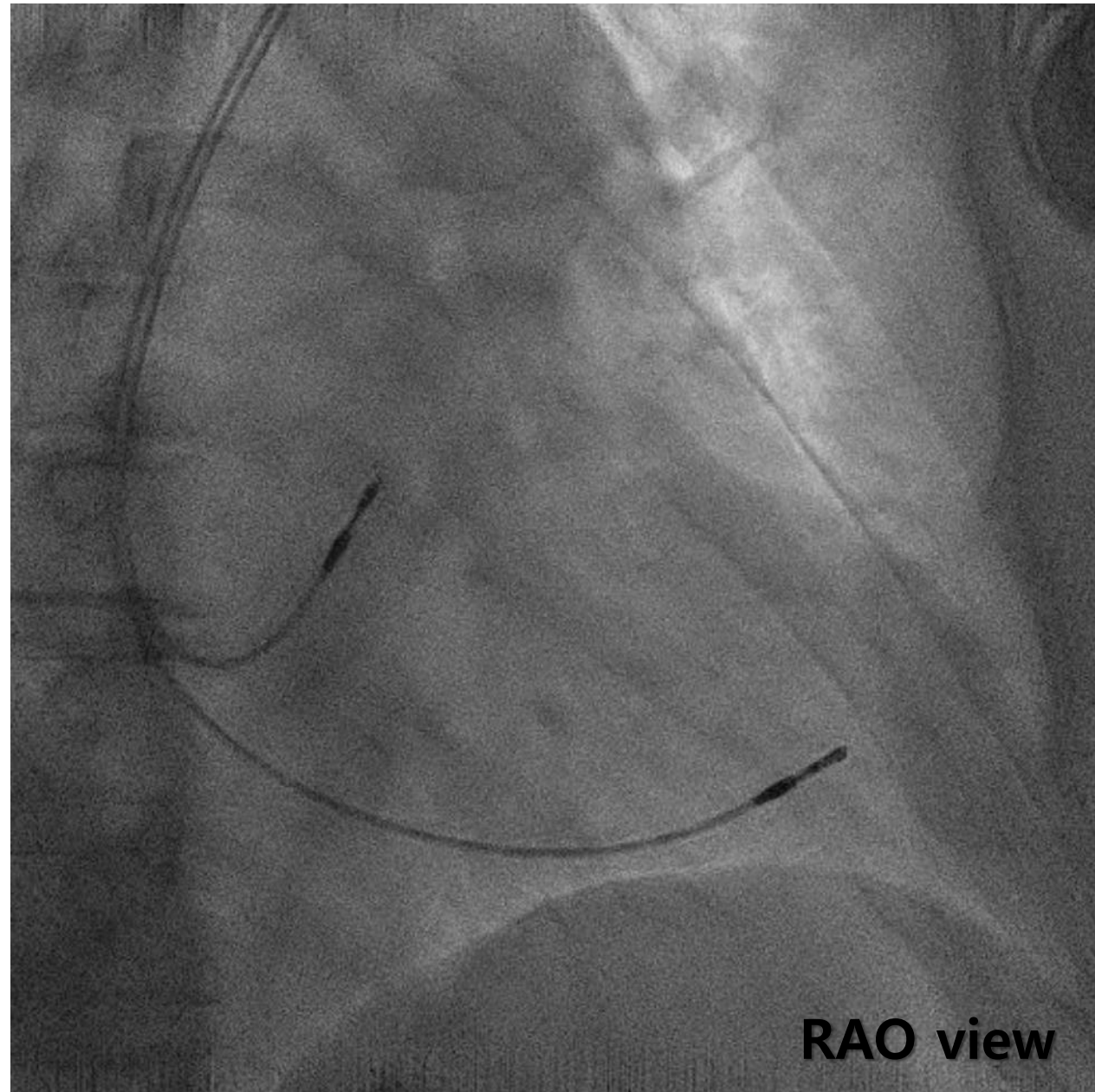


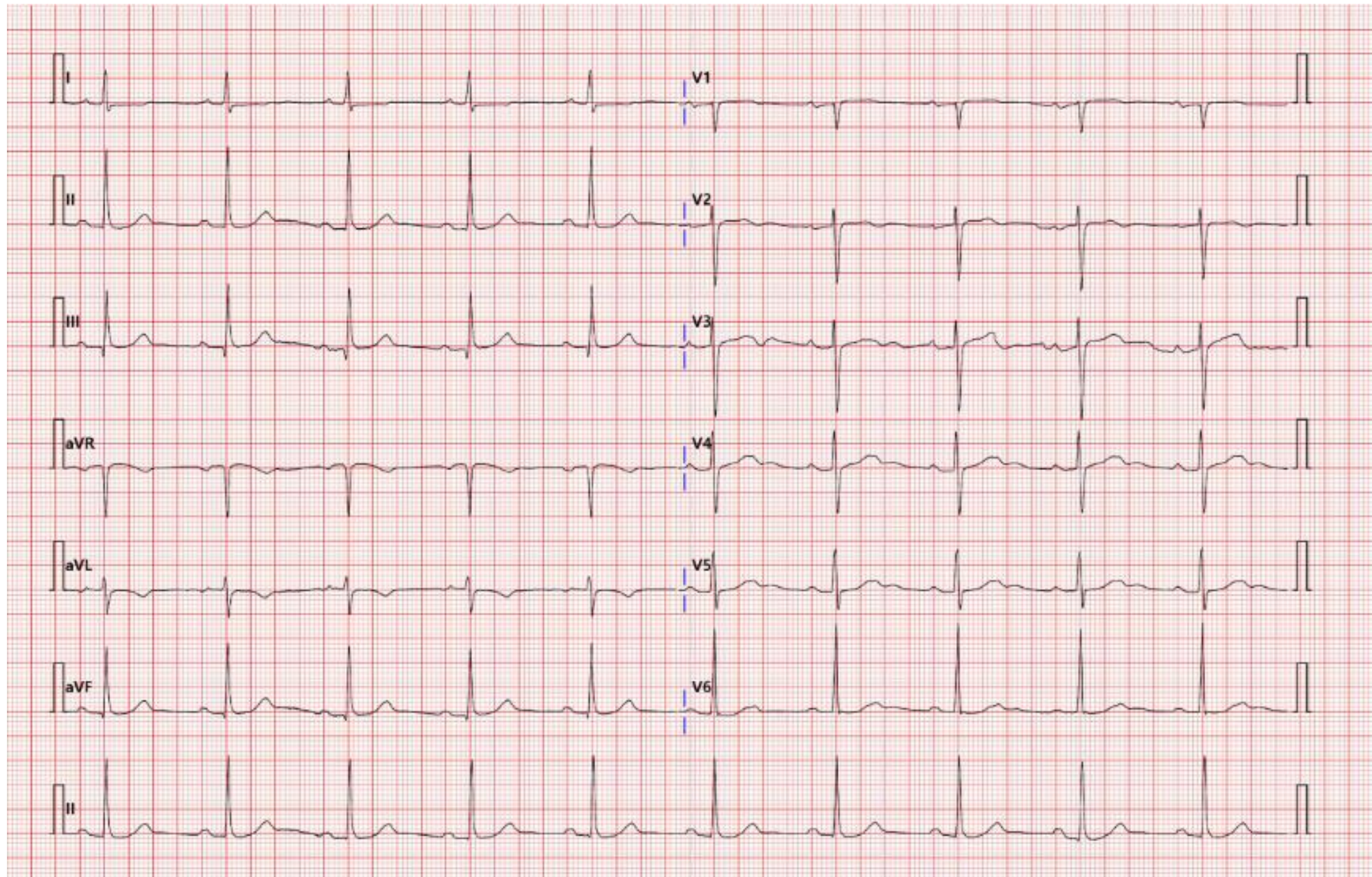
## Conventional Pacemaker vs. LBBP Pacemaker ???











Thank you for  
your attention !

계명대학교 동산병원  
KEIMYUNG UNIVERSITY DONGSAN HOSPITAL